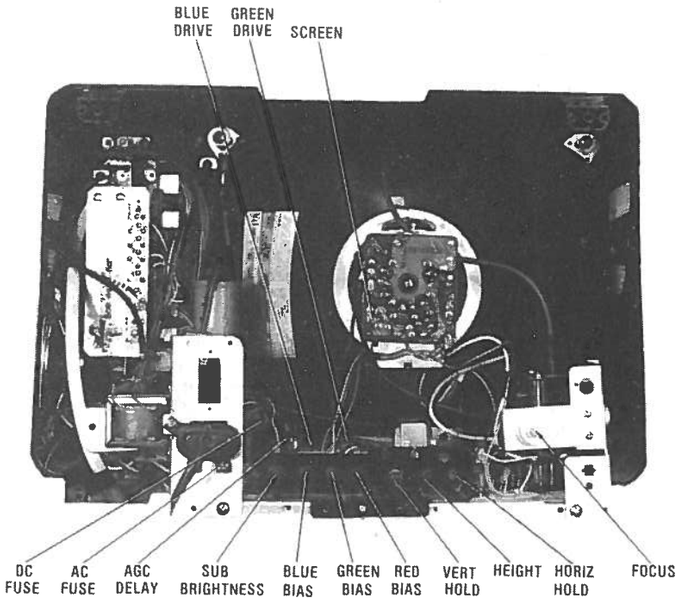

CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove eight screws holding cabinet back and remove back. Disconnect speaker and antenna leads. Channel readout indicator may be removed at this point of disassembly. Disconnect HV anode, CRT socket, deflection yoke connector, degaussing coil connector and ground leads. Remove six screws holding tuner remote receiver tuning selector panel assembly to cabinet front and remove assembly from cabinet. Channel indicator is accessible for servicing. Lift rear of main board and remove assembly from cabinet. Remove two screws holding control assembly to cabinet front and remove assembly from cabinet.

CRT REMOVAL

(Caution: Set employs CRT with yoke permanently bonded to CRT. Do not attempt to remove yoke from CRT with TC suffix to type number.) Follow "Chassis Removal" procedure and lay set facedown on a soft protective surface. Loosen and remove CRT neck assemblies (See caution). Remove four screws holding CRT to cabinet front and lift CRT out of cabinet. Do not lift CRT by the neck.

SERVICING IN THE FIELD

CRT IMPLOSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

FUSE DEVICES

A .4-amp fuse is used for low-voltage power-supply protection. (See photo, Cabinet - Rear View.)

A 3-amp fuse is used for AC line protection. (See photo, Cabinet - Rear View.)

A .2-amp fuse is used for remote power-supply protection. (See Remote Power Board.)

LAMP ACCESSIBILITY

Tuner assembly must be removed. See Disassembly Instructions.

CHANNEL TUNING

Twelve numbered buttons on the remote are provided for direct access channel selection with channel up and channel down buttons provided for channel scanning.

Twelve preset tuning controls are provided for pretuning.

AFT switch is provided for selection of manual or automatic fine tuning.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the Horizontal Hold. (See photo, Cabinet - Rear View.)

FOCUS

The focus may be varied by a focus control. (See photo, Cabinet - Rear View.)

AGC

The AGC may be varied by AGC Delay control. (See photo, Cabinet - Rear View.)

SAMS PHOTOFACT®
For Supplier Address See PHOTOFACT Index

Model TCK-405PR

SAFETY PRECAUTIONS

See page 4.

SERVICE INFORMATION

See page 7.

INDEX

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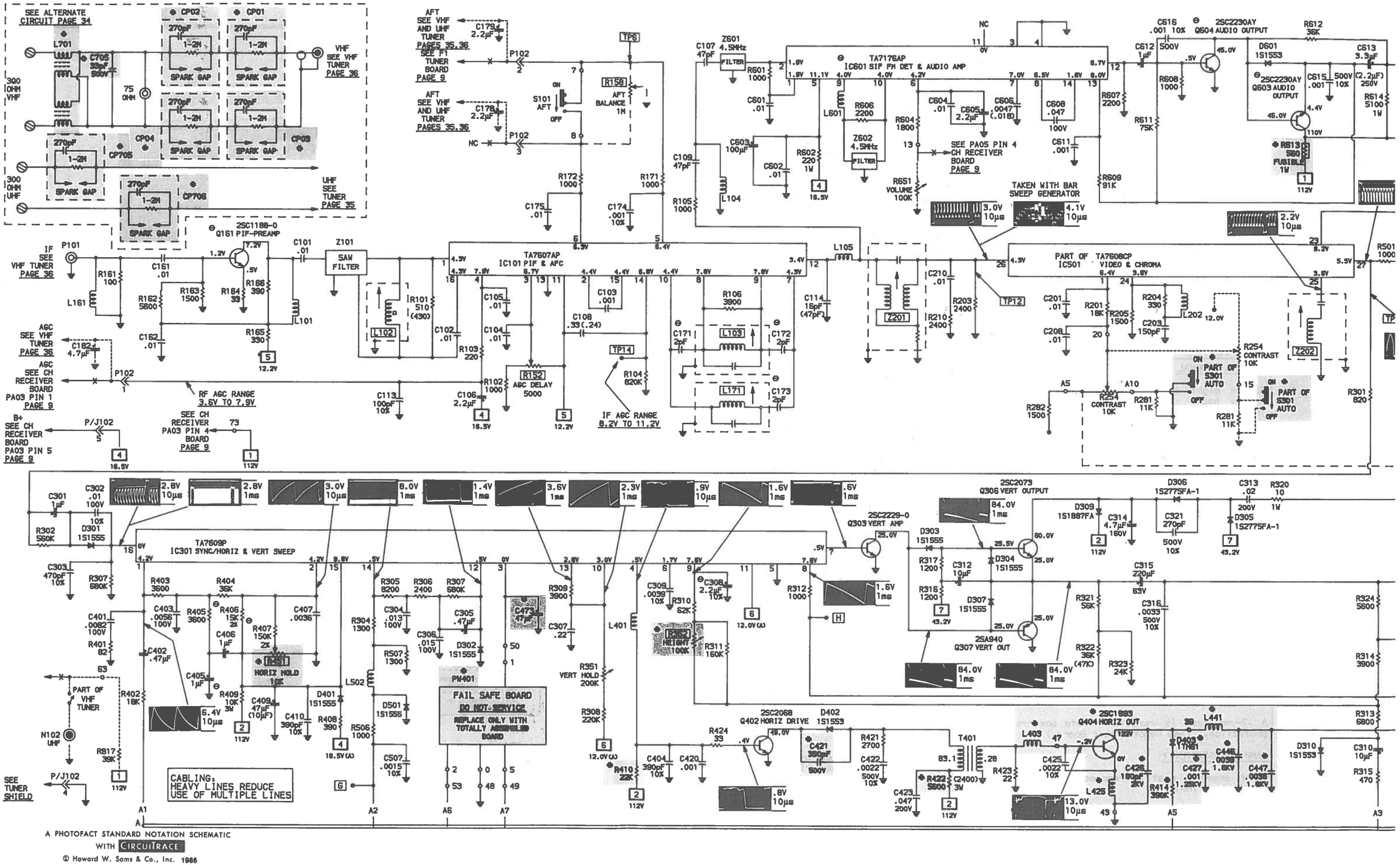
Printed in U.S. of America. 86PD01318

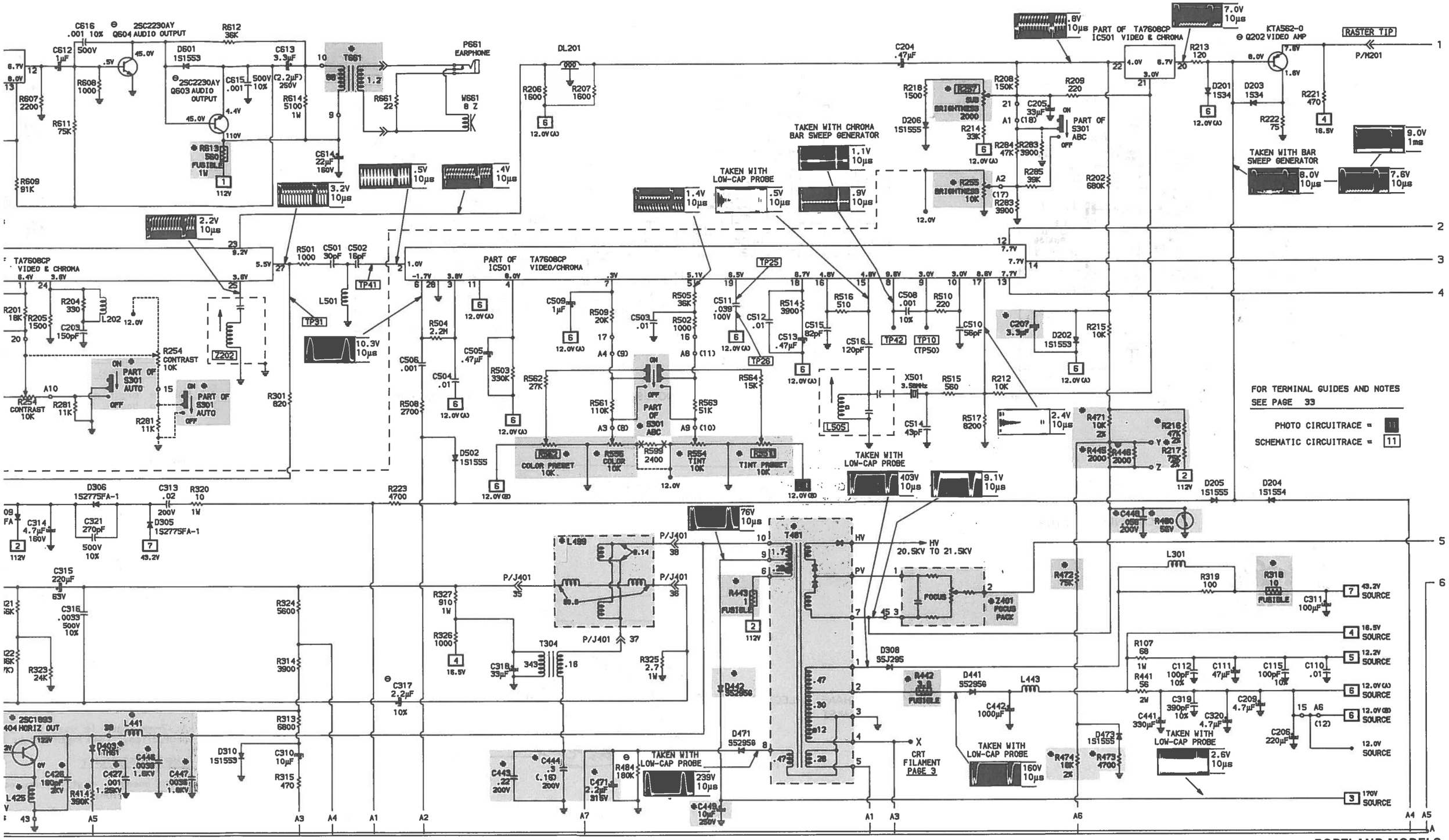
10 9 8 7 6 5 4 3 2 1

DATE 10-86 SET 2440 FOLDER 1

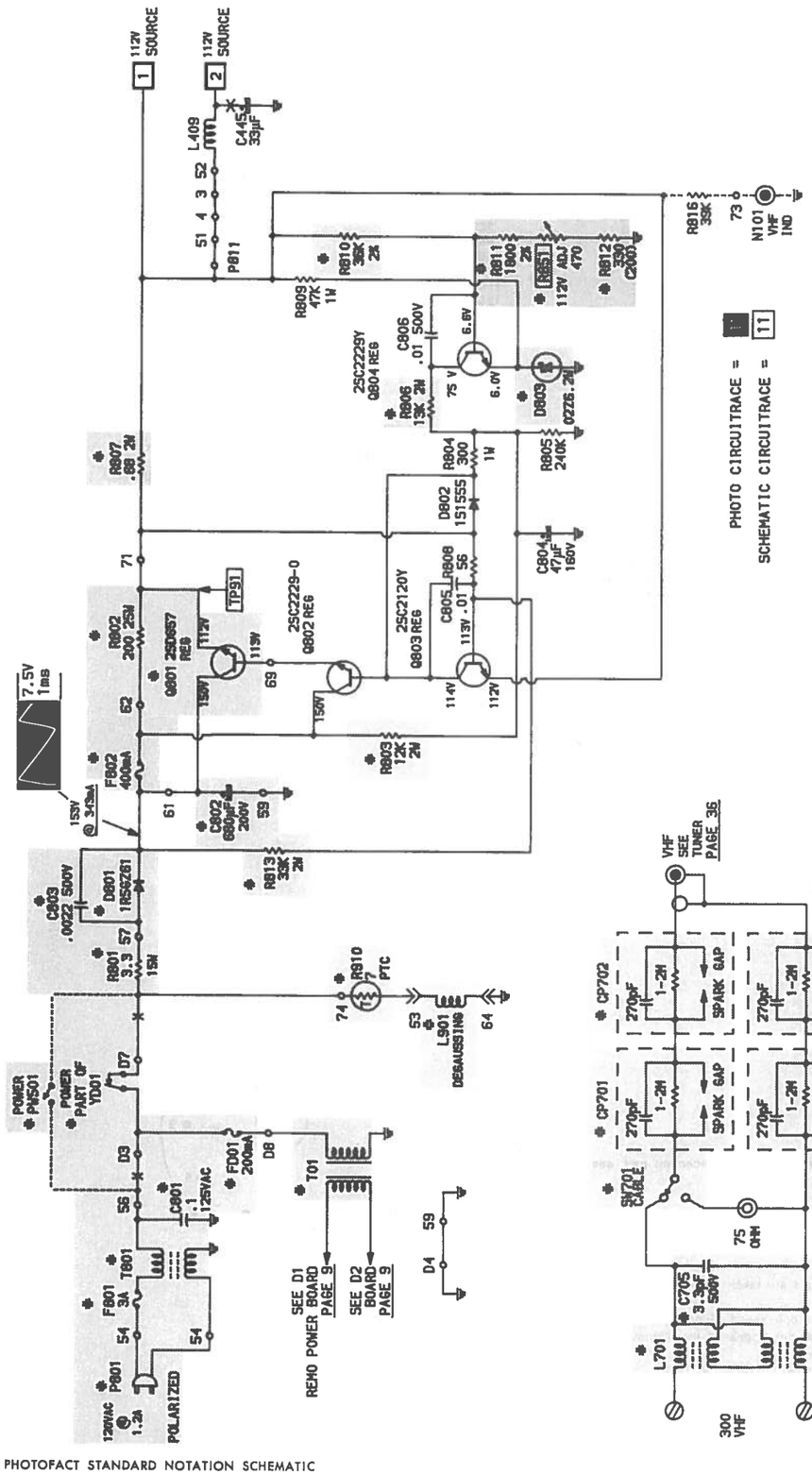
SET 2440 FOLDER 1



A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE

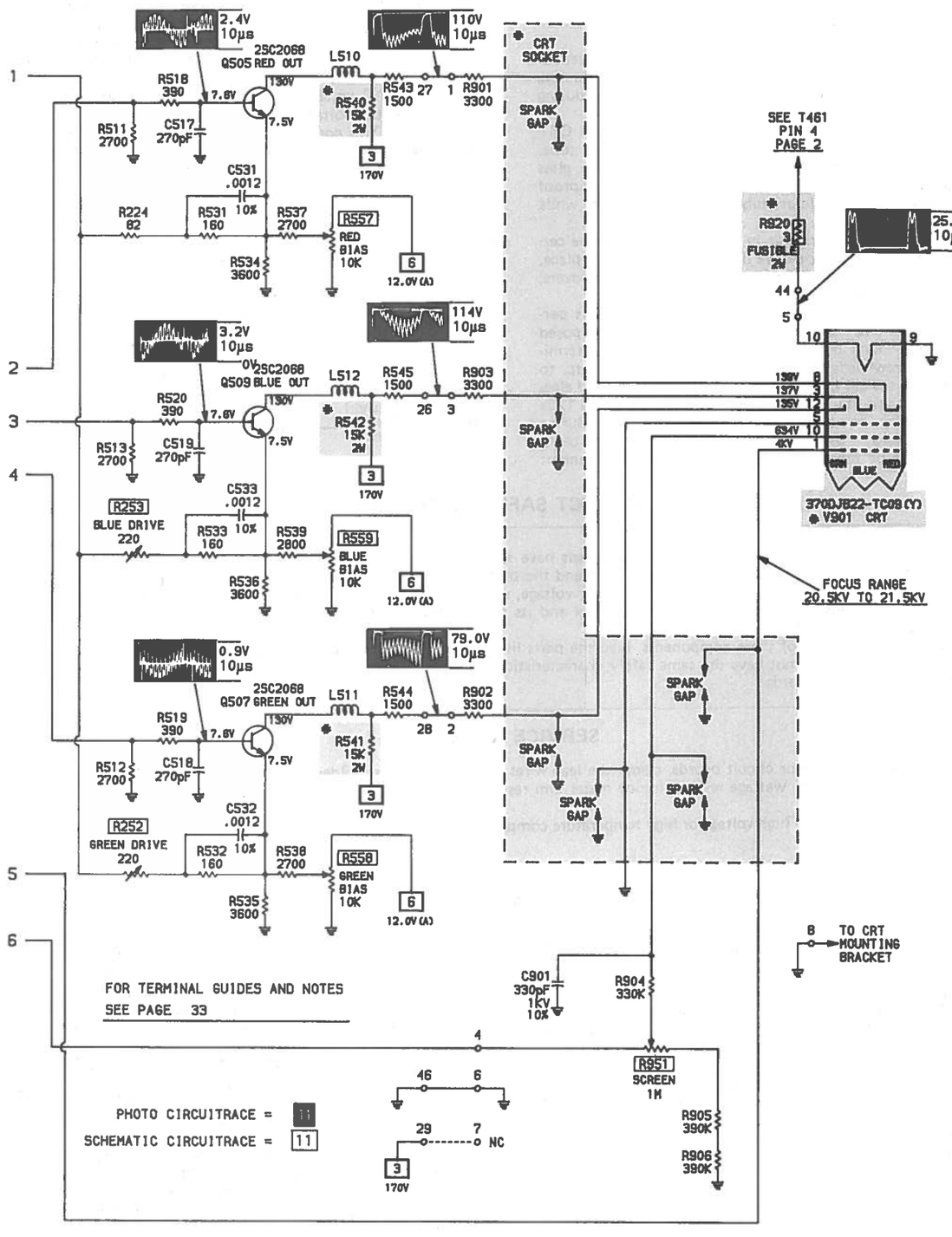


PORTLAND MODELS
TCK-403P,TCK-404P,TCK-405PR



A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE™

POWER SUPPLY SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITRACE™

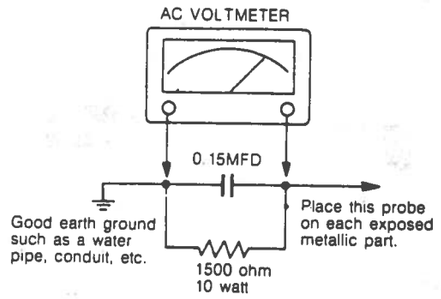
CRT SCHEMATIC

SAFETY PRECAUTIONS

WARNING: Service should not be attempted by anyone unfamiliar with the necessary precautions on this receiver. The following are the necessary precautions to be observed before servicing.

1. Since the chassis of this receiver has hazardous potential to ground whenever the receiver is plugged in (floating chassis), an isolation transformer must be used during service to avoid shock hazard.
2. Always discharge the picture tube anode to the CRT conductive coating before handling the picture tube. The picture tube is highly evacuated and if broken, glass fragments will be violently expelled. Use shatter-proof goggles and keep picture tube away from the body while handling.
3. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
4. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as antennas, terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120v AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner:

Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd, AC type capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 mfd capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3 volts RMS. This corresponds to 0.2 milliamp. AC. Any value exceeding this limit consitutes a potential shock hazard and must be corrected immediately.



PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by shading on the schematic diagram

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire, X-ray radiation or other hazards.

SERVICE NOTES

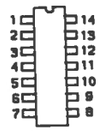
1. When replacing parts or circuit boards, clamp the lead wires to terminals before soldering. (Specially for Fail Safe Board)
2. When replacing a high wattage resistor (oxide metal film resistor) in circuit board, keep the resistor 10mm (½ in.) away from circuit board.
3. Keep wires away from high voltage or high temperature components.

X-RAY RADIATION PRECAUTION

1. Excessive high voltage can produce potentially hazardous X-RAY RADIATION. To avoid such hazards, the high voltage must not be above the specified limit. The nominal value of the high voltage of this receiver is 24.5 kv at zero beam current (minimum brightness) under a 120v AC power source. The high voltage must not, under any circumstances, exceed 26.7kv.
   Each time a receiver requires servicing, the high voltage should be checked following the HIGH VOLTAGE CHECK procedure on page 7 of this manual. It is recommended the reading of the high voltage be recorded as a part of the service record. It is important to use an accurate and reliable high voltage meter.
2. This receiver is equipped with a Fail Safe (FS) circuit which prevents the receiver from producing an excessively high voltage even if the B + voltage increases abnormally. Each time the receiver is serviced, the FS circuit must be checked to determine that the circuit is properly functioning, following the FS CIRCUIT CHECK procedure on page 7 of this manual.
3. The only source of X-RAY RADIATION in this TV receiver is the picture tube. For continued X-RAY RADIATION protection, the replacement tube must be exactly the same type tube as specified in the parts list.
4. Some parts in this receiver have special safety-related characteristics for X-RAY RADIATION protection. For continued safety, parts replacement should be undertaken only after referring to the PRODUCT SAFETY NOTICE below.

Courtesy of Manufacturer

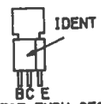
Q161
BOTTOM VIEW



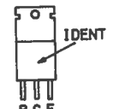
IC601
TOP VIEW

IC501
TOP VIEW

IC101, IC301
TOP VIEW

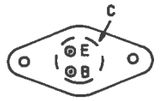


Q402, Q505 THRU Q509
FRONT VIEW

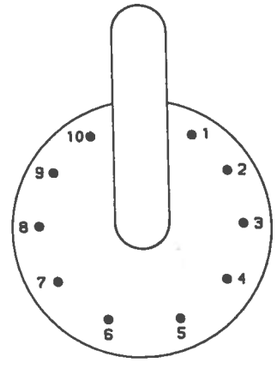


Q306, Q307
FRONT VIEW

Q202, Q303, Q603, Q604, Q802, Q803, Q804
BOTTOM VIEW



Q404, Q801
BOTTOM VIEW



T461
BOTTOM VIEW

For SAFETY use only equivalent replacement part, see parts list.
—✕— Circuitry not used in some versions
- - - Circuitry used in some versions
⊖ See parts list
❋ Nominal value
⏚ Ground

Waveforms and voltages are taken from ground, unless noted otherwise.
Waveforms: triggered scope, keyed rainbow generator.
Item numbers in rectangles appear in the alignment/adjustment instructions.
Supply voltages maintained as shown at input.
Voltages measured with digital meter, no signal.
Controls adjusted for normal operation.
Terminal identification may not be found on unit.
Capacitors are 50 volts or less, 5% unless noted.
Electrolytic capacitors are 50 volts or less, 20% unless noted.
Resistors are ½W or less, 5% unless noted.
Value in ( ) used in some versions.

TERMINAL GUIDES AND NOTES

TROUBLESHOOTING (Continued)

try. Vertical linearity or foldover can be caused by vertical feedback and bias circuits. Check Electrolytics C315 and C317 and associated circuitry. If the vertical is off frequency, check the voltages, waveforms and components associated with pins 9, 10, 12 and 13 of IC301.

SYNC

Check voltages and waveforms at pins 1, 14 and 16 of Sync/Horiz and Vert Sweep IC (IC301). Check for the proper vertical waveform at pin 12 of IC301. Check for the proper horizontal waveform at pin 2 of IC301. The sync separator is part of IC301. Check for 9.60V at pin 15 of IC301.

RASTER

Check CRT and CRT voltages. If the raster is magenta, check voltages and waveforms at pin 13 of Video/Chroma IC (IC501) and the Green Output Transistor (Q507) and associated circuitry. If raster is yellow, check voltages and waveforms at pin 14 of IC501 and the Blue Output Transistor (Q509) and associated circuitry. If raster is cyan, check voltages and waveforms at pin 12 of IC501 and the Red Output Transistor (Q505) and associated circuitry.

CHROMA

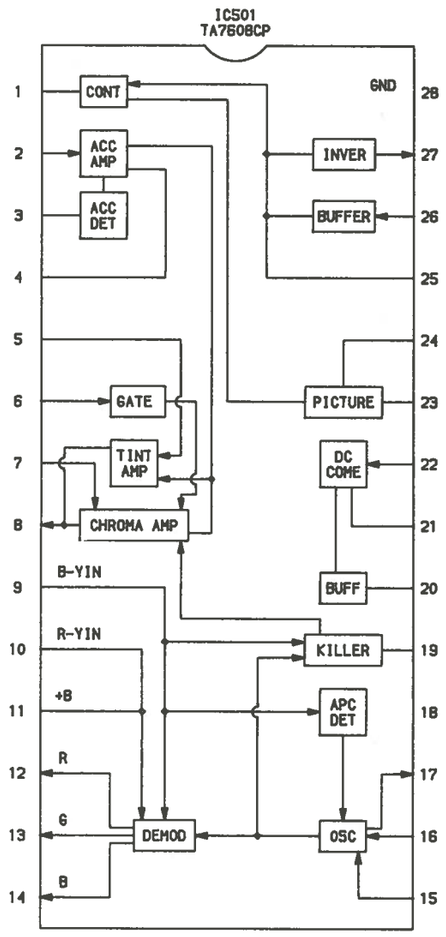
If there is no color, inject a color signal at TP12 and check for the proper chroma waveforms at pins 12, 13 and 14 of Video/Chroma IC (IC501). If the waveforms are not present, check voltage and waveforms on pins 2 thru 19 of IC501. For weak color, check the voltage and waveform at pin 19 of IC501, 3.58MHz Crystal (X501), alignment of L505 and associated circuitry. If there is no color sync, check the voltage and waveform at pin 6 of IC501, check Diode D501 and associated circuitry. For incorrect hue (tint), check pins 2, 5 and 8 of IC501 and check associated circuitry. If there is no green, check the voltages and waveforms at pin 13 of IC501, TP46G, TP47G and associated circuitry. If there is no blue, check the voltages and waveforms at pin 14 of IC501, TP46B, TP47B and associated circuitry. If there is no red, check the voltages and waveforms at pin 12 of IC501, TP46R, TP47R and associated circuitry.

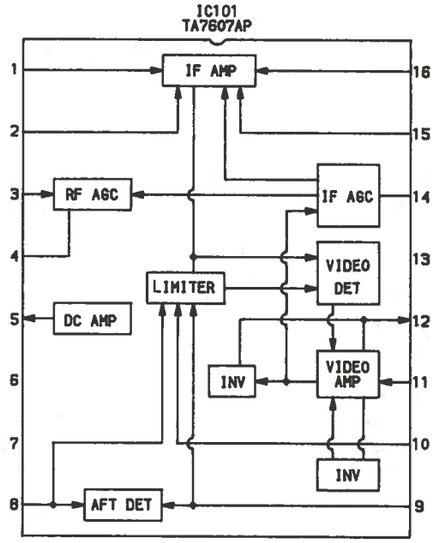
TUNER CONTROL PARTS LIST

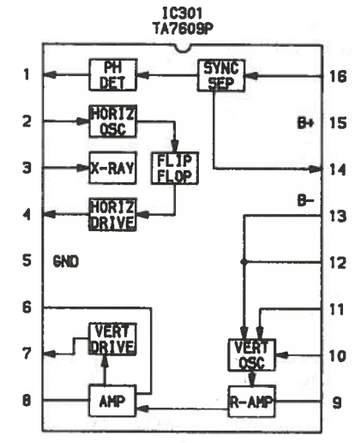
LOCATION NUMBER	STOCK NUMBER	DESCRIPTION
CHANNEL RECEIVER BOARD ASSEMBLY		
IA01	1UPC1363C-	IC, μPC1363C
IA02	1UPD1937C-	IC, μPD1937C
XA01	5910800010	CERAMIC RESONATOR, CBS 455A
QA02, 03, 11, 12, 13, 14, 15	TKTC1815Y-	TR, KTC1815(Y)
QA04, 06, 07, 08	TKTA1015Y-	TR, KTA1015(Y)
QA10	TKTC2120Y-	TR, KTC 2120(Y)
DA01~ DA24	DKDS1555--	DIODE, KDS1555
DA26~ DA29		
RA01~ RA12	555104002B	VR, RV-FA11 (100K)
PRE-AMP BOARD ASSEMBLY		
QB01	TBC414C---	TR, BC414C
QB02, 03	TKTC1815Y-	TR, KTC 1815(Y)
DB01	DPH302----	DIODE, PH302

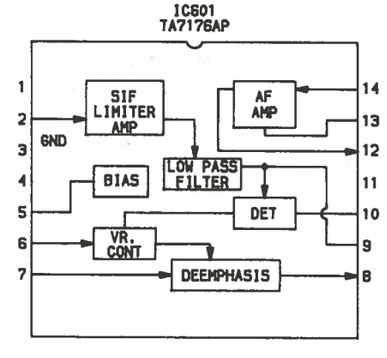
LOCATION NUMBER	STOCK NUMBER	DESCRIPTION
ON-OFF SWITCH BOARD		
SW1~ SW3	5460010030	SWITCH, T-P5025
REMOCON POWER PCB ASSEMBLY		
ID01	1LM340T12-	IC, LM340T-12
DD01~04	DIN4002---	DIODE, 1N4002
DD05	DKDS1555--	DIODE, KDS1555
YD	54C0010010	RELAY, JC1A-DC12V TV
REMOCON TRANSMITTER BOARD ASSEMBLY		
IC01	1μPD1986C-	IC, μPD 1986C
QC01	TKTC1815Y-	VR, KTC 1815(Y)
QC02	TBC414C---	TR, BC414C
DC01, 02	DKDS1555--	DIODE, KDS 1555
DC03	DKLR124E--	LED, KLR124E
DC04, 05	DLD271----	DIODE, LD271
XC01	5910800010	CERA RESONATOR, CBS455A

Courtesy of Manufacturer









PORTLAND MODELS
TCK-403P,TCK-404P,TCK-405PR

FOLDER 1

IC FUNCTIONS

TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

Equipment Name	B & K Precision Equipment No.	Sencore Equipment No.
OSCILLOSCOPE	1560	SC61
GENERATORS		
RGB	1260	
MULTIBURST SIGNAL	1260	VA62
COLOR BAR	1211A,1248,1251,1260	VA62, CG25
ANALOG VOM	277	
DIGITAL VOM	2830	DVM37,DVM56,SC61
FREQUENCY METER	1803,1805	FC71,SC61
HI-VOLTAGE PROBE VOM/DMM Accessory probes	HV-44	HP200
ISOLATION TRANSFORMER	TR110,1604,1653,1655	PR57
CAPACITANCE ANALYZER	820	LC53
CRT ANALYZER	467,470	CR70
TEMPERATURE PROBE	TP-28	
AC LEAKAGE TESTER	1655	PR57
ILLUMINATION METER		
LOGIC PROBE	DP51	
LOGIC PULSER	DP101	
INDUCTANCE ANALYZER		LC53
FLYBACK YOKE TESTER		LC53,VA62

TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain line voltage at 120VAC.
Allow a 20-minute warm-up period for receiver and test equipment.
Suggested Alignment Tools: GC ELECTRONICS
L102, L103, L171, L505, Z201, Z202..... 9440

PRELIMINARY INSTRUCTIONS

Set the channel selector to the highest unused channel. Set scope sweep to external.
Connect scope vertical input to scope vertical input on sweep/marker generator. Connect scope external horizontal input to scope horizontal input on sweep/marker generator.
Ground test equipment to TV chassis unless specified otherwise. Use only enough generator output to provide a usable indication.
Note: Response may vary slightly from that shown.
Connect a +7.3V bias to TP14.
Set AGC Delay Control (R152) fully counterclockwise.
Place Auto Color Switch to Off Position.

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP12	To TP on VHF tuner	44MHz (10MHz Sweep)	45.75MHz	Adjust L103 for Maximum gain and symmetry of response. See Figure 1.
"	"	"	42.17MHz 44.00MHz 45.75MHz	Connect a 100 ohm resistor from TP8 to TP9. (Pin 8 and 9 of IC101). Adjust L102 for Maximum gain and symmetry of response. L102 affects 44.00MHz. L103 affects 45.75MHz. See Figure 2. NOTE: Remove resistor and re-adjust AGC Delay Control.

TROUBLESHOOTING

POWER SUPPLY

Check the AC Fuse (F801) and DC Fuse (F802). If Fuse F801 is open, check Capacitors C801, C803, Thermistor R910, Remote Power Transformer (T01), Diode D801 and Line Filter (T801). If Fuse F802 is open, check Voltage Regulator Transistor (Q801) and Horizontal Output Transistor (Q404). Apply 120V AC, depress the Power Switch and check for normal operation. If the set does not operate, check for 153V at the cathode of Diode D801. If this voltage is absent, check Resistor R801, Relay (YD01) and associated components. Check Relay Drive Transistor QA01 and associated components on Tuner Control Board. If 153V is present at the cathode of Diode D801, check for 112V at P811. If this voltage is absent, check the voltages, waveforms and components associated with Regulator Transistors (Q801, Q802, Q803, Q804) and Transistor Q404. If 112V is present at P811, refer to the "Horizontal" section of this Troubleshooting guide. If the voltage at P811 is 160V, the TV may be in shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide.

HORIZONTAL

Determine if the TV is in shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide. If the TV is not in shutdown, inject a horizontal drive signal at the base of the Horizontal Output Transistor (Q404). If horizontal deflection is now present, check the voltages, waveforms and components associated with pins 1 thru 5 and 15 of Sync/Horiz and Vert Sweep IC (IC301) and Horizontal Drive Transistor (Q402). If there is still no horizontal sweep, check the voltages, waveforms and components associated with Transistor Q404 and Horizontal Output Transformer (T461). Check Diodes D308, D441, D442 and associated components for defects. The High Voltage Rectifier is part of Transformer T461 and if defective will affect the performance of the horizontal circuits. If the horizontal oscillator is off frequency, check the voltages, waveforms and components associated with pins 1 and 2 of IC301. Horizontal linearity, foldover, or width problems may be caused by Capacitors C426, C427, C443 and C444 being defective.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by the Fail-Safe Module. Horizontal pulses are fed into the Fail-Safe Module at pin 5. Should the high voltage increase, the pulses at pin 5 will also increase and trigger the Fail-Safe Module, which activates the X-Ray protect circuit at pin 3 of Sync/Horiz and Vert Sweep IC (IC301) shutting down the set. To troubleshoot, short pin 3 of IC301 to ground and use a variac for AC power. Start at 70VAC and troubleshoot. Remove short from pin 3 of IC301.

NOTE: Care should be taken in defeating the high voltage shutdown circuit as this may cause excessive X-Ray radiation and damage to the CRT, Horizontal Output Transformer (T461) and associated components. Monitor the high voltage while troubleshooting.

IF-AGC

Inject a video IF signal at the IF Input and check for video on the CRT. If video is present, check the Tuner, Tuner Control and Tuner AFT circuits. If there is no video on the CRT, check for a video waveform at TP12. If video is present at TP12, refer to the "Video" section of this Troubleshooting guide. If there is no video at TP12, apply AGC bias to TP14. If video is now present at TP12, check the voltages and components associated with pins 3, 4 and 14 of PIF/AFT IC (IC101). If there is still no video at TP12, check the voltages, waveforms and components associated with pins 1, 2, 5 thru 13, 15 and 16 of IC101. A defective AGC circuit can cause an overloaded picture, excessive snow or loss of picture and sound. See the AGC voltage chart for AGC voltages with signal.

IC101
Pin 3 6.1V
Pin 4 3.2V
Pin 14 7.4V

AUDIO

Inject an audio signal at pin 12 of SIF/FM Det/Audio Amp IC (IC601) and check for audio at the Speaker. If there is no audio, check the voltages and components associated with Audio Output Transistors (Q603, Q604). If there is audio at the Speaker, inject an audio IF signal at TP21, and with volume at Maximum, check for audio at the Speaker. If there is no audio, check the voltages, waveforms and components associated with pins 1 thru 10, 13 and 14 of IC601. If there is audio at the Speaker, check the components associated with TP21 and Coil L105. Check the voltage at pin 6 of IC601, it should measure 4.2V at MINIMUM volume and 2.4V at Maximum.

VIDEO

Inject a video signal at TP12 and check for video on the CRT. If video is present, refer to the "IF-AGC" section of this Troubleshooting guide. If there is no video on the CRT, check for a video waveform at TP13. If there is no video, check the voltages, waveforms and components associated with pins 1, 11 and 20 thru 28 of Video/Chroma IC (IC501) and Video Amp Transistor (Q202). If there is a video waveform at TP13, check the voltages, waveforms and components associated with the Red, Green, Blue Output Transistors (Q505, Q507, Q509) and the CRT. If the brightness is inadequate or cannot be controlled, check the voltages and components associated with pins 1, 21, 22 of IC501 and pin 10 of the CRT.

VERTICAL

Check pin 11 of the Sync/Horiz and Vert Sweep IC (IC301) for 12.0V and check for 60.0V at the collector of Vertical Output Transistor (Q306). Inject a vertical signal at the base of the Vertical Amp Transistor (Q303). If vertical deflection returns, check voltages and waveforms on pins 6 thru 13 of IC301 and check associated circuitry. If no vertical deflection, check Transistors Q303, Q306 and Q307, Diodes D303 thru D309 and associated circui-

TROUBLESHOOTING AID

Note: Waveforms taken with triggered scope, Keyed-Rainbow generator. Schematic voltages measured with digital meter, no signal. Controls adjusted for normal operation.

PICTURE or SOUND

NO PIC, NO SOUND, NO RASTER: Check AC power supply and sources generated from Horizontal Output Transformer (T461). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T461). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T461) sources and Video circuit. Refer to "Troubleshooting" Horizontal and Video circuits.

NO PIC, HAS SOUND, HAS RASTER: Refer to "Troubleshooting" Video circuit.

HAS PIC, NO SOUND: Refer to "Troubleshooting" Audio circuit.

OVERLOADED PICTURE: Refer to "Troubleshooting" IF-AGC circuit.

LOW OR EXCESSIVE BRIGHTNESS: Check Video and Luminance circuits. Refer to "Troubleshooting" Video circuit.

SWEEP

NO RASTER, HAS SOUND: Check HV rectifier, Part of Horizontal Output Transformer (T461). Refer to "Troubleshooting" Horizontal circuit.

NO RASTER, NO SOUND: Refer to "Troubleshooting" Horizontal circuit.

NO VERT DEFLECTION: Refer to "Troubleshooting" Vertical circuit.

POOR VERT LIN OR FOLDOVER: Refer to "Troubleshooting" Vertical circuit.

POOR HORIZ LIN OR FOLDOVER: Refer to "Troubleshooting" Horizontal circuit.

NARROW PICTURE: Refer to "Troubleshooting" Horizontal circuit.

VERT OFF FREQUENCY: Refer to "Troubleshooting" Vertical circuit.

HORIZ OFF FREQUENCY: Refer to "Troubleshooting" Horizontal circuit.

SYNC

NO VERT/HORIZ SYNC: Refer to "Troubleshooting" Sync circuit.

RASTER

YELLOW (NO BLUE): Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

CYAN (NO RED): Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

MAGENTA (NO GREEN): Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

(COLOR (B/W operating normally)

NO COLOR: Refer to "Troubleshooting" Chroma circuit.

WEAK COLOR: Refer to "Troubleshooting" Chroma circuit.

NO COLOR SYNC: Refer to "Troubleshooting" Chroma circuit.

NO GREEN: Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

NO BLUE: Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

NO RED: Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

INCORRECT HUE (TINT): Refer to "Troubleshooting" Chroma circuit.

TV ALIGNMENT INSTRUCTIONS (Continued)

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
To TP on VHF tuner	To TP12	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR Instructions above. See Figure 3.

4.5MHz TRAP ALIGNMENT

Tune in a strong TV signal and set the contrast at maximum. Adjust the fine tuning until a beat pattern is visible on the screen. Adjust Z201 for MINIMUM beat interference.

AUTOMATIC FINE TUNING ALIGNMENT

Connect as explained in preliminary instructions unless specified otherwise. Auto Color Switch to On. Disconnect Plug P102. Connect a 100 ohm resistor from TP8 to TP9 (pin 8 & pin 9 of IC101). Connect positive lead of voltmeter to TP6 (CircuitTrace 37), negative lead to TP7 CircuitTrace 38. Adjust AFT Balance Control (R158) for +0.2V DC. Remove voltmeter leads. Connect Plug P102.

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP6 (CircuitTrace 37)	To TP on VHF tuner	44.00MHz (10MHz Sweep)	45.75MHz	Adjust L171 for Maximum gain and symmetry of response and to place 45.75MHz marker at zero crossover. See Figure 4. Remove 100 ohm damping resistor.

3.58MHz TRAP ALIGNMENT

This adjustment is made with set turned Off and AC power cord disconnected. Connect a scope and signal generator across 3.58MHz Trap Coil (Z202). Set generator to 3.58MHz and adjust Z202 for MINIMUM.

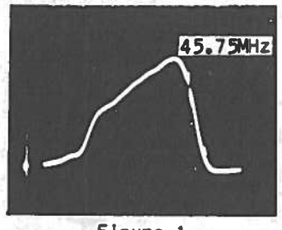


Figure 1

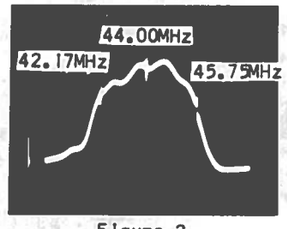


Figure 2


Figure 3

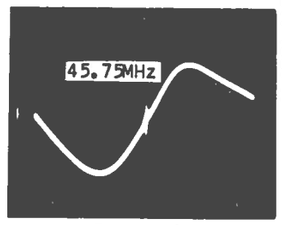


Figure 4

SERVICE INFORMATION

FS CIRCUIT CHECK

The Fail Safe (FS) circuit check is indispensable for the final check in the servicing. Checking should be done following the steps below.

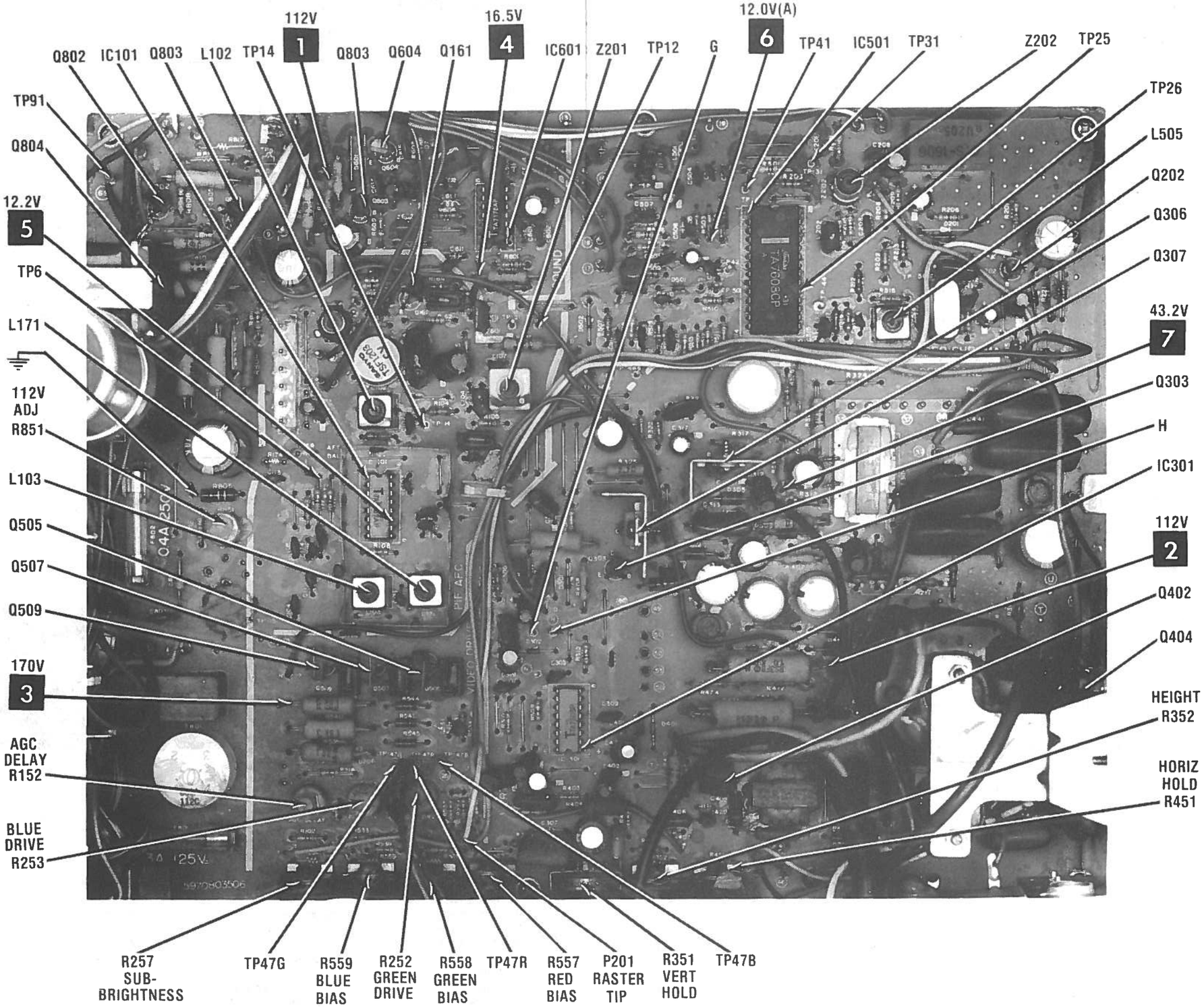
1. Turn the power switch on and adjust customer controls for normal operation.
2. Termporarily short TP-R and TP-X on FS Board (See figure 9) with a jumper wire. Raster and sound will disappear.
3. The receiver must remain in this state even after removing the jumper wire. This is the evidence that the FS circuit is functioning properly.
4. To obtain a picture again, temporarily turn the receiver off all allow the FS circuit more than 30 seconds to reset. Then turn the power switch on to produce a normal picture.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. The +112 volt power supply must be properly adjusted to insure the correct high voltage.

1. Connect an accurate high voltage must to the second anode of the picture tube.
2. Turn on the receiver. Set the AUTO switch to the OFF position. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage will be measured below 26.7kv.
4. Rotate the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the limit under any conditions.

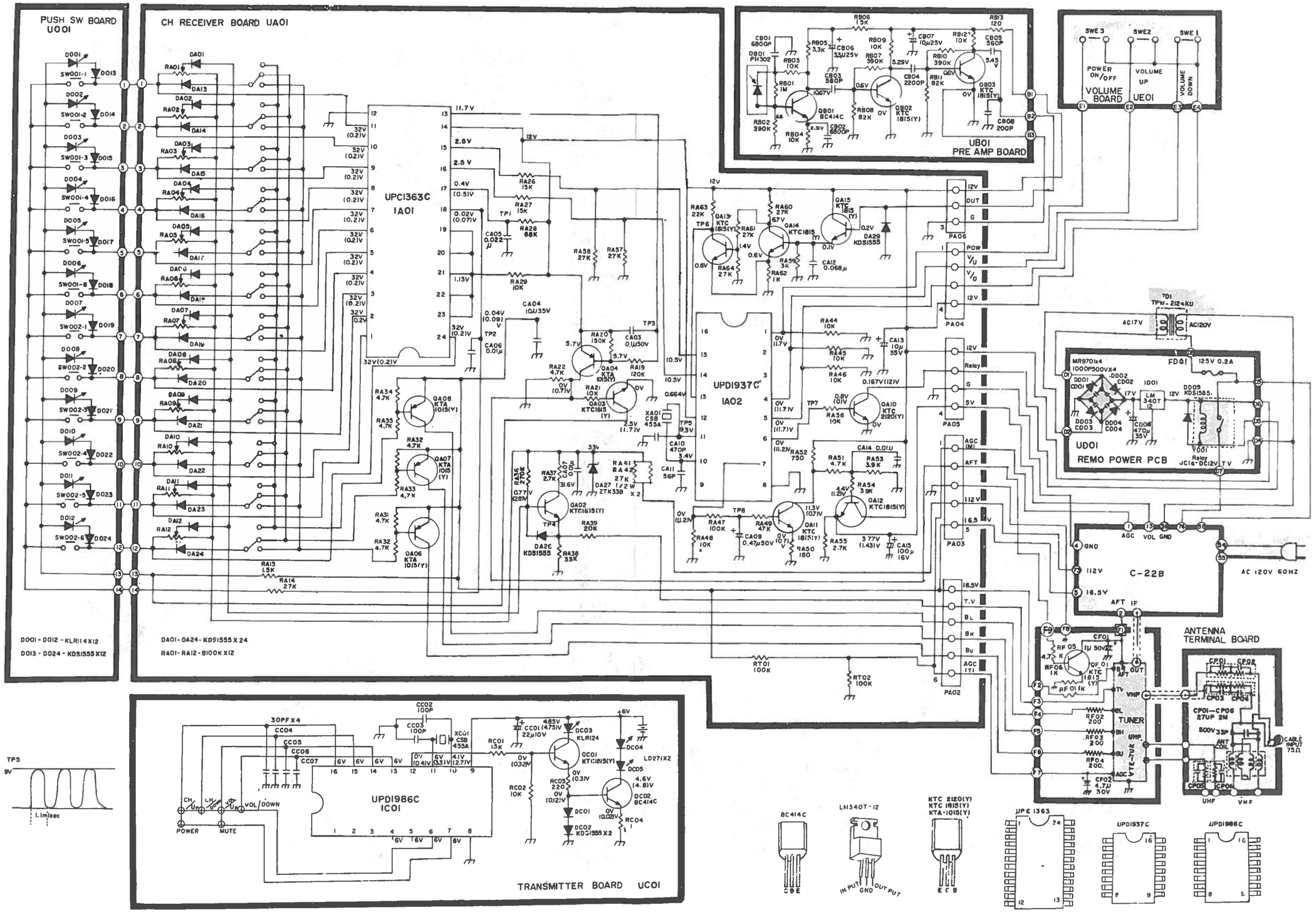
Courtesy of Manufacturer



NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

SCHEMATIC DIAGRAM
MODEL; TCK-405PR

S/N : 4858802316



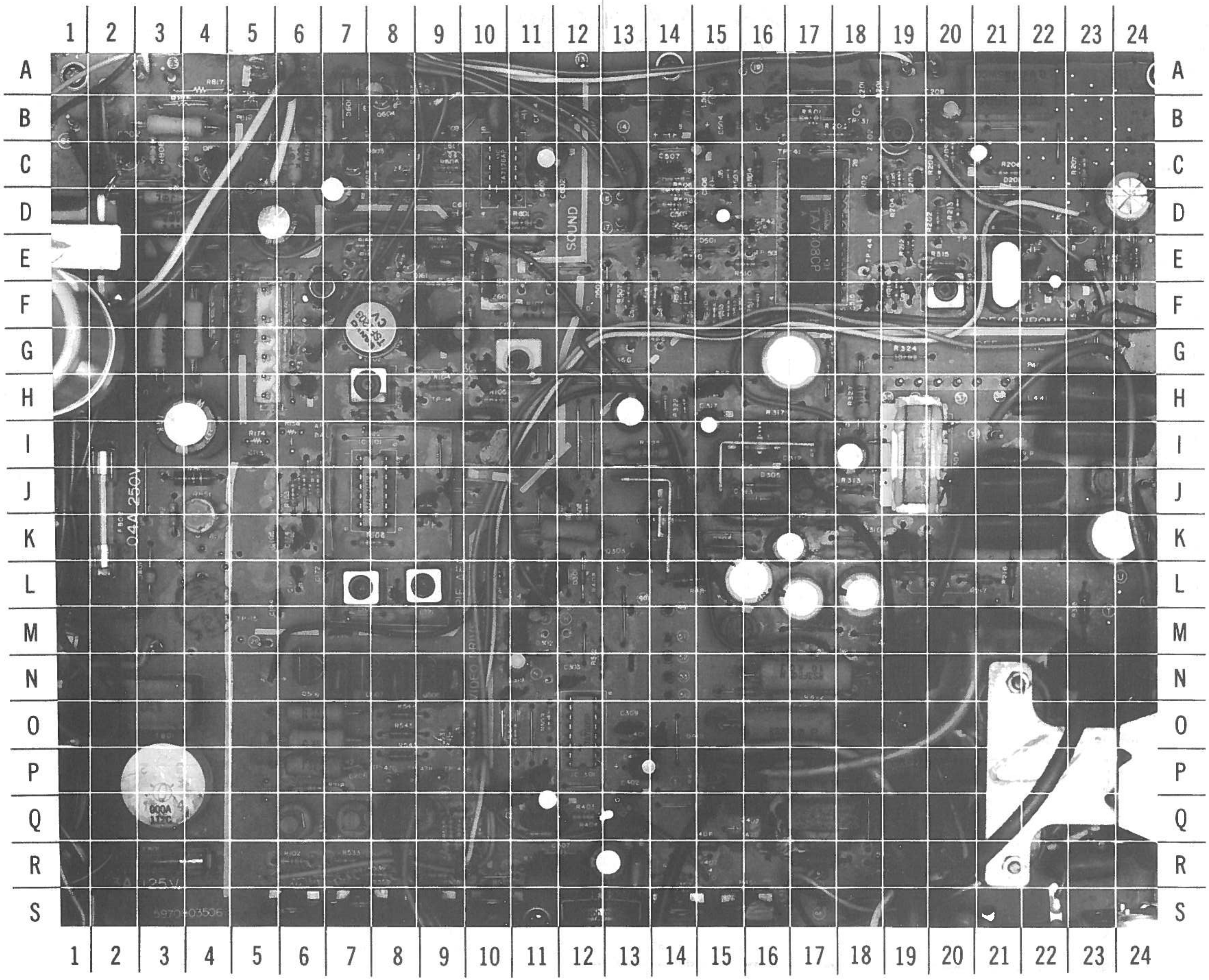
TUNER CONTROL SCHEMATIC

Courtesy of Manufacturer

TUNER CONTROL SCHEMATIC

PORTLAND MODELS
TCK-403P,TCK-404P,TCK-405PR

FOLDER 1



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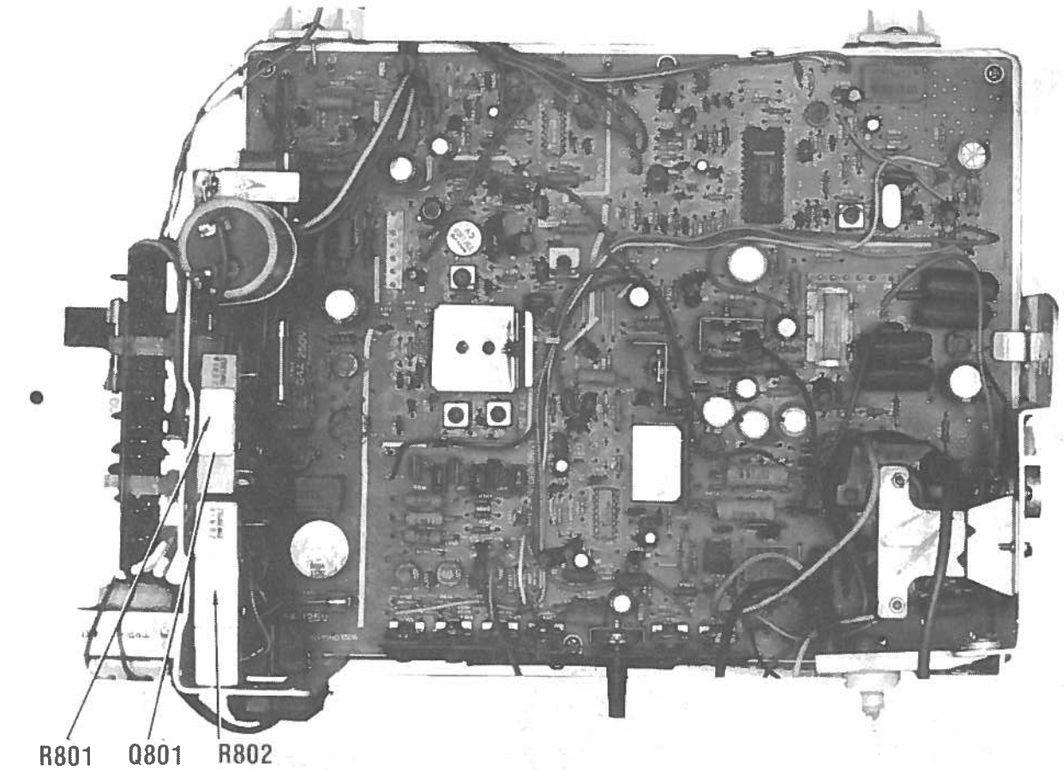
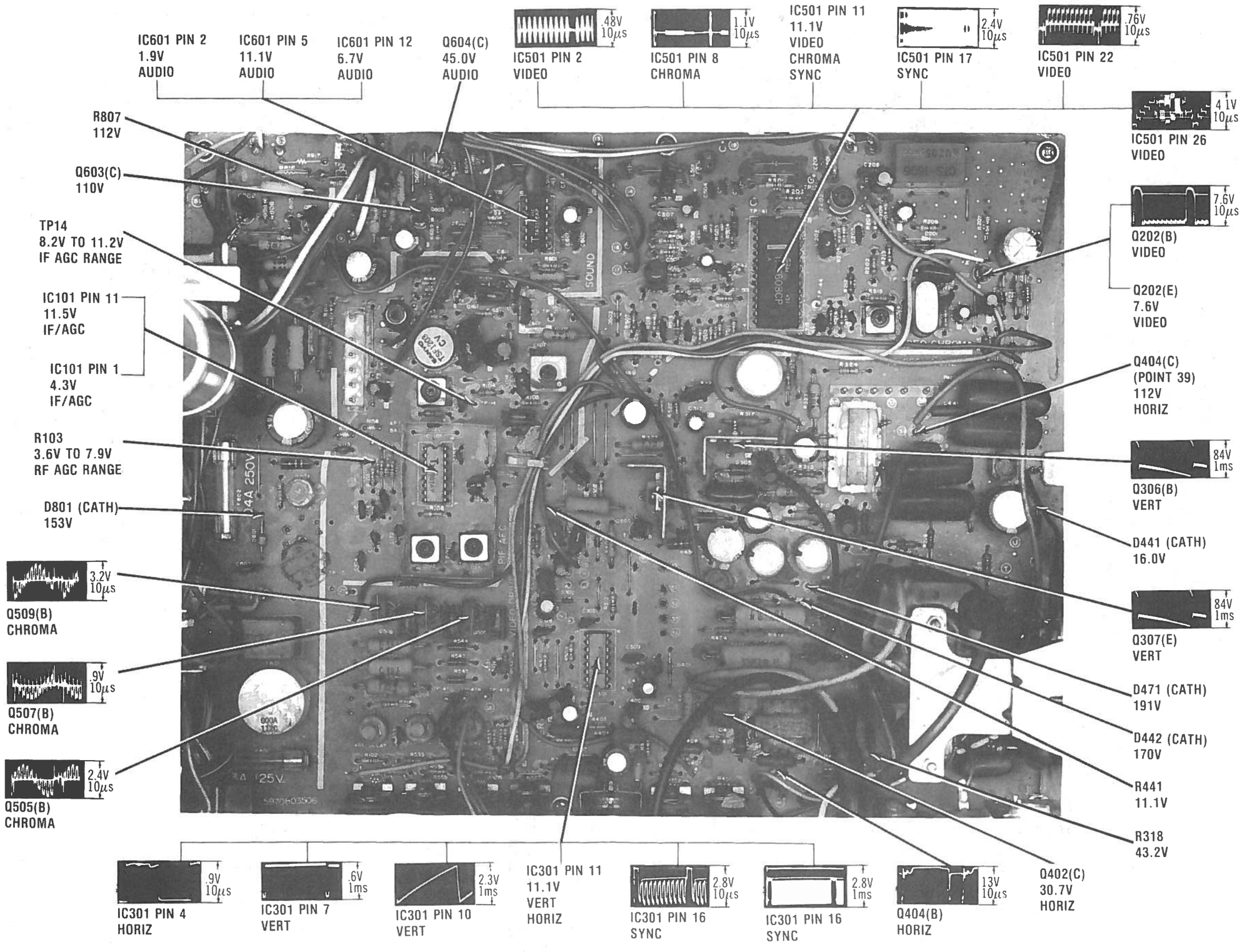
PORTLAND MODELS
TCK-403P,TCK-404P,TCK-405PR

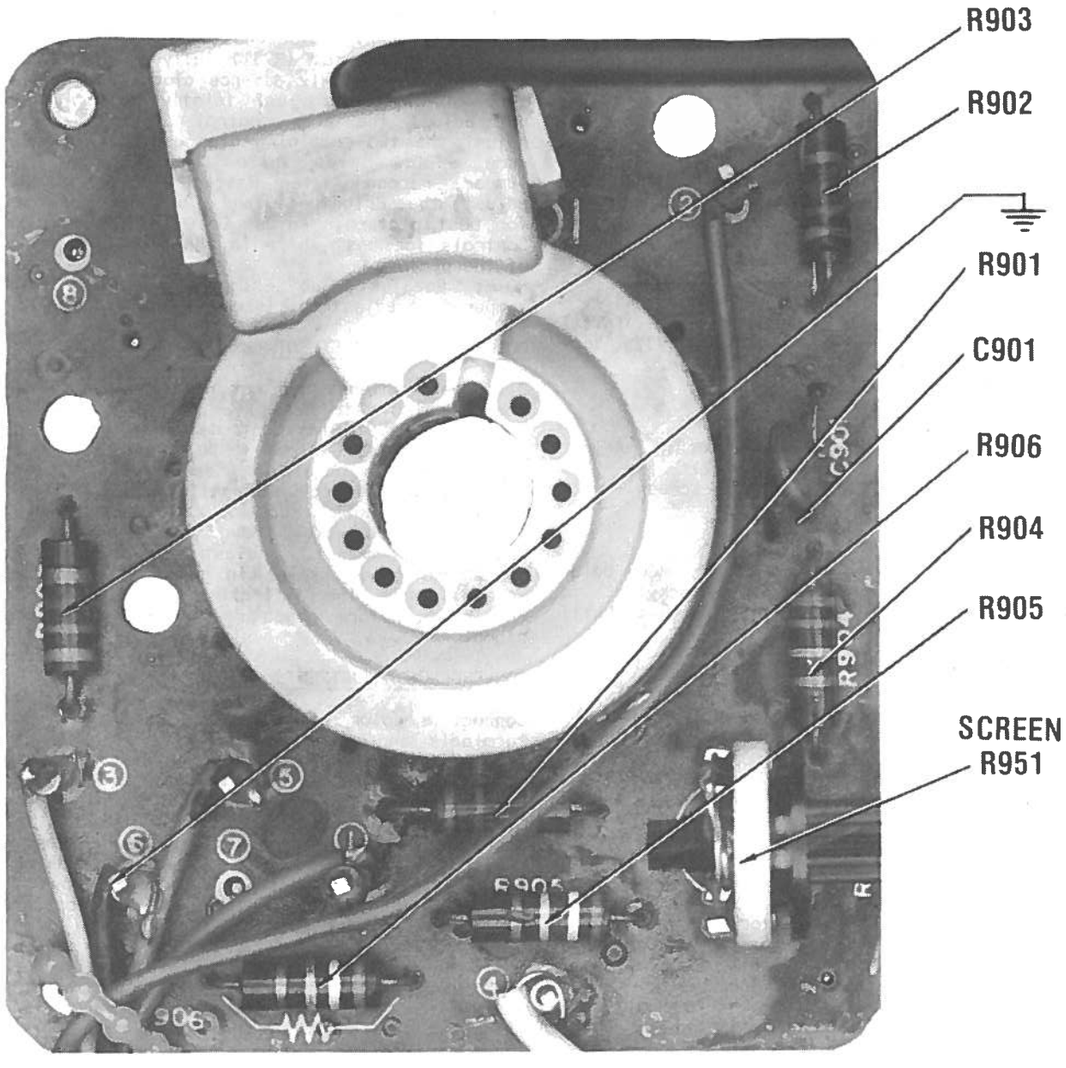


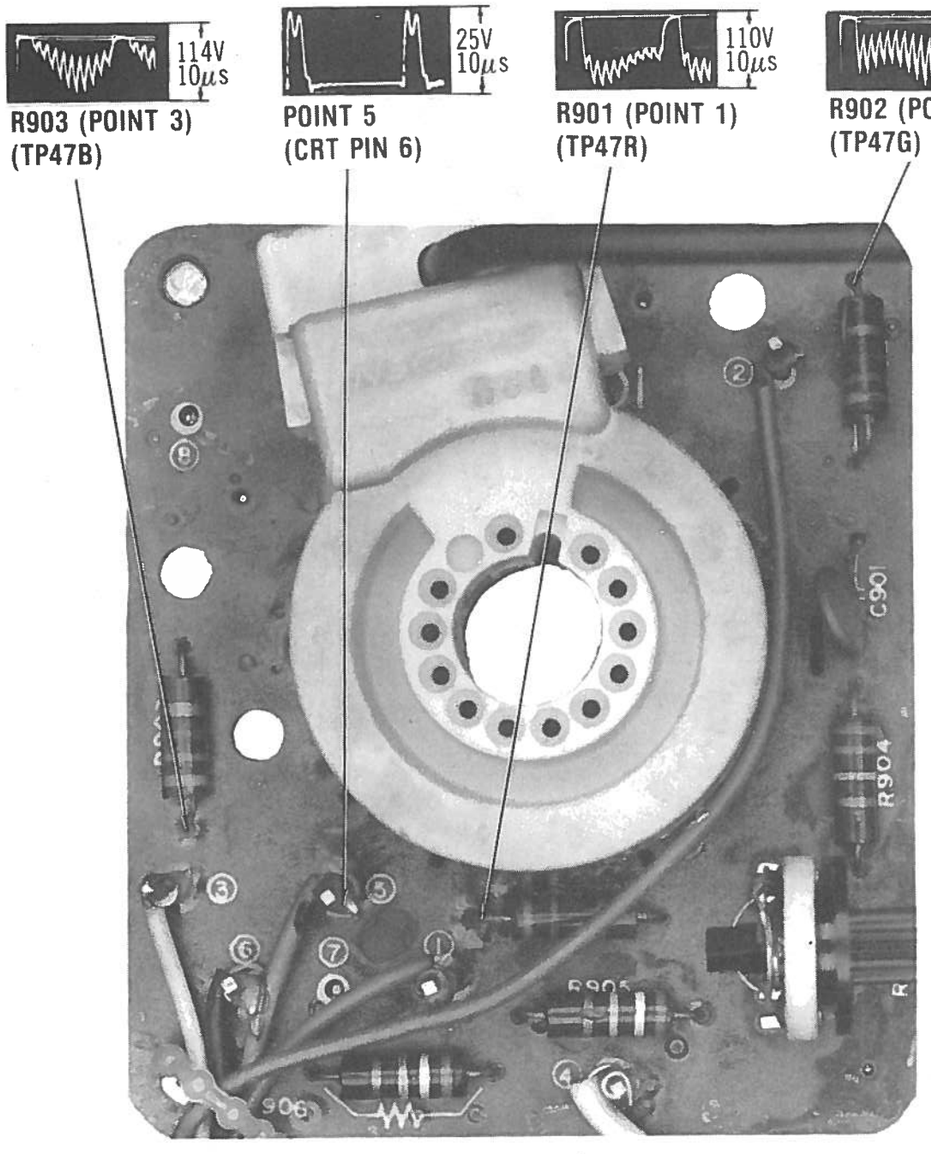
MAIN BOARD - SHIELD LOCATION

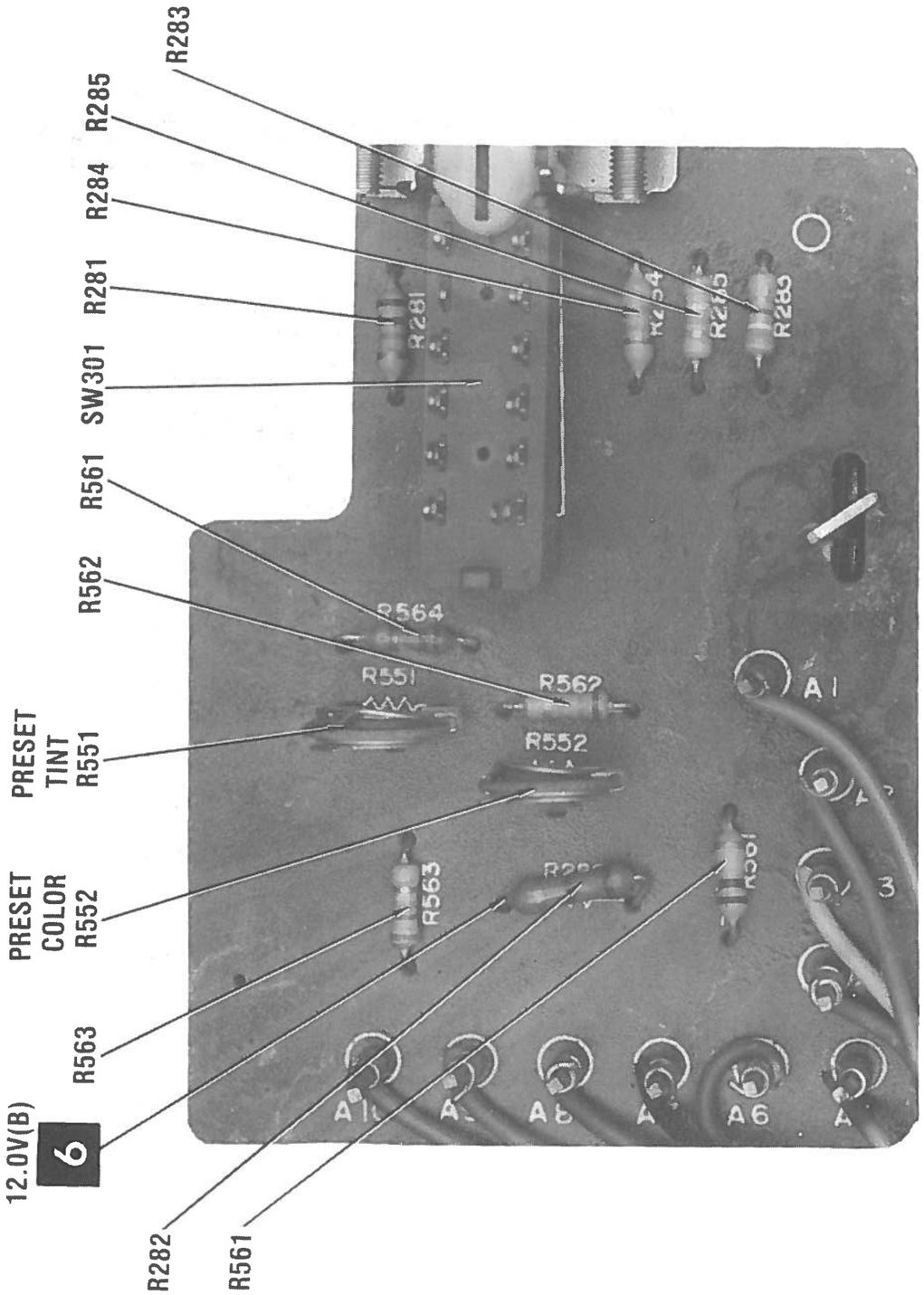
MAIN BOARD - GridTrace LOCATION GUIDE

C101	F-9	C449	L-17	F801	R-3	R210	B-13	R504	C-16	TP42	D-16
C102	H-9	C471	L-16	F802	K-2	R212	E-19	R505	C-15	TP47B	P-9
C103	J-8	C473	P-13	G	M-11	R213	D-20	R506	C-14	TP47G	P-8
C104	L-6	C501	B-16	H	M-11	R214	R-6	R507	F-13	TP47R	P-8
C105	K-6	C502	B-16	IC101	J-8	R215	F-23	R508	C-14	TP91	B-1
C106	H-6	C503	D-14	IC301	O-12	R216	L-21	R509	D-14	X501	E-21
C107	G-10	C504	B-15	IC501	D-17	R217	L-21	R510	E-16	Z101	G-8
C108	F-8	C505	C-15	IC601	C-10	R218	P-6	R511	F-16	Z201	G-11
C109	G-10	C506	C-15	L101	E-9	R221	E-24	R512	F-15	Z202	B-19
C110	J-9	C507	C-14	L102	H-8	R222	E-24	R513	F-15	Z601	E-10
C111	G-9	C508	D-16	L103	L-7	R223	K-22	R514	F-22	Z602	C-8
C112	J-9	C509	D-15	L104	H-10	R224	Q-10	R515	E-20		
C114	I-10	C510	E-14	L105	H-10	R252	Q-8	R516	F-19		
C115	M-7	C511	D-21	L161	D-7	R253	Q-7	R517	F-19		
C161	E-7	C512	E-22	L171	L-9	R257	S-6	R518	F-14		
C162	E-10	C513	E-22	L202	D-18	R301	B-14	R519	F-14		
C171	L-8	C514	F-20	L301	O-12	R302	J-12	R520	F-15		
C172	L-7	C515	F-18	L401	O-13	R303	K-11	R531	O-9		
C173	L-6	C516	F-19	L403	R-17	R304	L-10	R532	R-8		
C174	K-6	C517	F-13	L409	M-15	R305	M-10	R533	R-7		
C175	K-6	C518	F-14	L441	H-22	R306	L-10	R534	O-10		
C201	A-18	C519	F-15	L443	J-23	R307	M-11	R535	Q-9		
C203	C-19	C531	O-9	L501	A-15	R308	R-11	R536	P-6		
C204	C-21	C532	Q-8	L502	D-14	R309	O-11	R537	Q-10		
C205	B-20	C533	Q-7	L505	F-20	R310	O-11	R538	R-9		
C206	D-24	C601	C-11	L510	N-9	R311	R-14	R539	R-8		
C207	E-23	C602	C-11	L511	N-8	R312	N-12	R540	O-6		
C208	B-20	C603	C-11	L512	N-7	R313	J-18	R541	O-6		
C209	B-14	C604	C-11	P101	F-6	R314	G-17	R542	P-6		
C210	B-13	C605	B-12	P102	G-5	R315	M-23	R543	O-8		
C301	J-11	C606	B-10	P201	R-10	R316	I-17	R544	O-8		
C302	L-11	C608	B-9	P401	H-20	R317	I-16	R545	P-8		
C303	N-12	C611	D-9	Q161	E-8	R318	Q-22	R557	S-10		
C304	M-11	C612	B-8	Q202	D-23	R319	P-23	R558	S-9		
C305	L-11	C613	C-7	Q303	K-13	R320	J-17	R559	S-7		
C306	L-11	C614	D-5	Q306	I-16	R321	H-15	R601	D-11		
C307	R-11	C615	B-8	Q307	K-14	R322	H-14	R602	D-11		
C308	N-11	C616	A-8	Q402	Q-16	R323	H-14	R604	B-12		
C309	O-13	C801	O-3	Q404	N-24	R324	G-19	R606	C-9		
C310	K-18	C802	G-1	Q505	N-9	R325	I-13	R607	A-9		
C311	Q-24	C803	M-2	Q507	N-7	R326	G-18	R608	A-9		
C312	J-17	C804	I-4	Q509	N-6	R327	H-18	R609	C-8		
C313	J-16	C805	C-4	Q603	C-7	R351	S-12	R611	B-8		
C314	K-17	C806	D-2	Q604	A-8	R352	S-14	R612	B-7		
C315	G-17	D201	D-21	Q801	M-1	R401	Q-13	R613	C-6		
C316	H-15	D202	E-23	Q802	C-2	R402	K-18	R614	C-6		
C317	I-15	D203	E-23	Q803	C-4	R403	Q-12	R801	M-1		
C318	I-18	D204	F-23	Q804	E-2	R404	Q-12	R802	Q-1		
C319	N-11	D205	F-24	RASTER TIP	R-10	R405	Q-11	R803	G-4		
C320	P-11	D206	P-6	R101	H-8	R406	R-15	R804	G-4		
C321	L-14	D301	L-12	R102	R-6	R407	R-14	R805	J-4		
C401	Q-13	D302	M-11	R103	J-6	R408	L-12	R806	E-3		
C402	Q-13	D303	J-14	R104	H-9	R409	N-17	R807	B-3		
C403	Q-11	D304	J-14	R105	H-10	R410	P-15	R808	C-3		
C404	O-14	D305	J-16	R106	K-8	R414	Q-24	R809	D-3		
C405	Q-11	D306	K-15	R107	F-11	R421	P-17	R810	D-3		
C406	Q-10	D307	J-15	R152	Q-6	R422	O-16	R811	F-5		
C407	R-13	D308	Q-22	R158	I-6	R423	Q-16	R812	K-3		
C409	R-13	D309	K-17	R161	E-7	R424	Q-15	R813	G-3		
C410	S-17	D310	K-17	R162	F-9	R441	K-12	R851	K-4		
C420	R-15	D401	O-14	R163	F-7	R442	N-24	R910	H-2		
C421	R-16	D402	P-16	R164	E-7	R443	L-20	R920	O-24		
C422	P-17	D403	P-24	R165	F-10	R445	R-19	T304	I-19		
C423	Q-19	D441	K-24	R166	E-9	R446	R-19	T401	Q-17		
C425	N-24	D442	M-18	R171	J-6	R451	S-16	T461	P-21		
C426	O-24	D471	M-17	R172	J-6	R460	Q-19	T801	P-3		
C427	R-24	D473	M-17	R201	A-19	R471	K-19	TP6	I-6		
C441	H-13	D501	E-15	R202	D-20	R472	N-17	TP10	E-16		
C442	K-23	D502	F-13	R203	B-18	R473	O-17	TP12	F-11		
C443	J-21	D601	B-7	R204	C-19	R474	N-16	TP14	H-9		
C445	L-18	D801	L-3	R205	C-19	R484	L-14	TP25	E-18		
C446	I-23	D802	B-2	R206	C-21	R501	B-17	TP26	D-22		
C447	H-23	D803	F-2	R208	C-19	R502	D-14	TP31	B-18		
C448	R-23	D1201	A-21	R209	C-20	R503	C-16	TP41	B-16		




R903
R902
R901
C901
R906
R904
R905
SCREEN
R951


114V
10µs
R903 (POINT 3)
(TP47B)
25V
10µs
POINT 5
(CRT PIN 6)
110V
10µs
R901 (POINT 1)
(TP47R)
79V
10µs
R902 (POINT 2)
(TP47G)



AUTO SWITCH BOARD

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MISCELLANEOUS ADJUSTMENTS

CHANNEL TUNING

1) Connect antenna
2) Turn power on
3) Open Tuning Control access door
4) Turn off AFT Switch
5) Select channel to be pretuned
6) Depress and rotate corresponding Preset Tuning Control to select desired channel
7) Release and rotate preset Tuning Control to tune desired channel
8) Follow steps 5-7 for each channel to be pretuned
9) After pretuning close Tuning Control Access Door
10) Turn on AFT

HORIZ HOLD ADJUSTMENT

Tune in a local channel. Adjust Horiz Hold Control (R451) until it is virtually impossible for horizontal not to lock when switching from channel to channel.

112 VOLT ADJUSTMENT

Tune in a color bar pattern. Connect Digital Meter to TP91 (Q801). Adjust 112 Volt Adjustment (R851) +112V. Remove meter.

VERTICAL HEIGHT ADJUSTMENT

Tune in a cross hatch pattern. Adjust Vertical Height Control (R352) for 10% overscan at both top and bottom of screen.

AGC DELAY ADJUSTMENT

Tune in a strong station. Turn AGC Delay Control (R152) fully counterclockwise to obtain snow. Then slowly turn clockwise until snow just disappears.

AUTO COLOR ADJUSTMENT

Tune in a color program and set Auto Color Switch to Off. Adjust all controls for a normal color picture. Set the Auto Color Switch to On. Adjust Color Preset (R552) for proper color saturation and Tint Preset (R551) for proper skin tones. Repeat procedure if necessary.

COLOR SYNC ADJUSTMENT

Connect a color bar generator to the antenna terminals and tune in a color bar pattern. Set Color and Tint Controls to midrange. Connect a 0.47uF capacitor from TP10 (pin 9, IC501) to TP41 (IC501, pin 2). Place a jumper wire from TP25 to TP26 (across C511). Adjust L505 until color bars stop or slowly drifts. Remove capacitor and jumper wire. Check all channels for proper color lock in.

SUB BRIGHTNESS ADJUSTMENT

Tune in an active station and set Brightness Control to Maximum. Adjust Sub Brightness Control (R257) to a point just before the picture starts to bloom.

COLOR TEMPERATURE ADJUSTMENT

Tune in a station and turn Color Control to MINIMUM. Set Contrast and Brightness Controls to midrange. Turn the Green (R252) and Blue (R253) Drive Controls and Sub Brightness Control (R257) to midrange. Set the Red (R557), Green (R558) and Blue (R559) Bias Controls to MINIMUM. Short Test Points G and H together with a jumper. Disconnect the Raster Tip. Turn Screen Control (R951) fully counterclockwise and then slowly advance clockwise until a line of one color just faintly appears. Do not adjust the bias control of this color. Adjust the two remaining bias controls to produce a low level white line. Remove the jumper, reconnect the Raster Tip (P201) and adjust the Brightness and Contrast Controls for best picture. Adjust Green and Blue Drive Controls for best white in the highlight areas of the picture.
NOTE: Readjust Sub Brightness after color temperature adjustment is completed.

COLOR PURITY ADJUSTMENT

Disconnect antenna and set Brightness and Contrast Controls to Maximum. Adjust Red (R557) and Blue (R559) Bias Controls to MINIMUM. Adjust Green Bias Control (R558) and Screen Control (R951) to obtain a green raster. Use a degaussing coil to demagnetize the CRT and mounting brackets. Loosen the clamp holding the deflection yoke. Move yoke back against the purity magnet. Adjust purity tabs to place the green stripe in the center of the screen. Move the deflection yoke forward to obtain a uniform green raster. Tighten yoke clamp.

CONVERGENCE ADJUSTMENT

Connect a color bar generator to the antenna terminals and tune in a dot pattern. Adjust 4-Pole Magnets to converge the red and blue dots at the center of the screen. Adjust 6-Pole Magnets to converge the red/blue dots over the green dots at the center of the screen. Tune in a crosshatch pattern. Remove rubber wedges between the deflection yoke and CRT. Tilt the deflection yoke up or down to converge the vertical lines at the top and bottom of the screen and the horizontal lines at the right and left sides of the screen. Tilt the deflection yoke to the right or left to converge the horizontal lines at the top and bottom of the screen and the vertical lines at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain the best overall convergence. Replace the rubber wedges.

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
	Antenna		UHF, Russell Replacement Antenna, LIN-2H
	Antenna	VL0A-2-800	UHF, Models TCK-403P, TCK-404P
	Antenna		VHF, Russell Replacement Assembly, POR-12H
	Antenna Rod		VHF Rod, Russell Replacement Rod, SIM-4H
	Antenna	4867601301 HC79022801	VHF, Models TCK-403P, TCK-404P
#	Antenna Terminal Assembly	4853611400	Used on Modesl TCK-403P, TCK-404P
	Ear Phone	VT10002301	

For SAFETY use only equivalent replacement part.

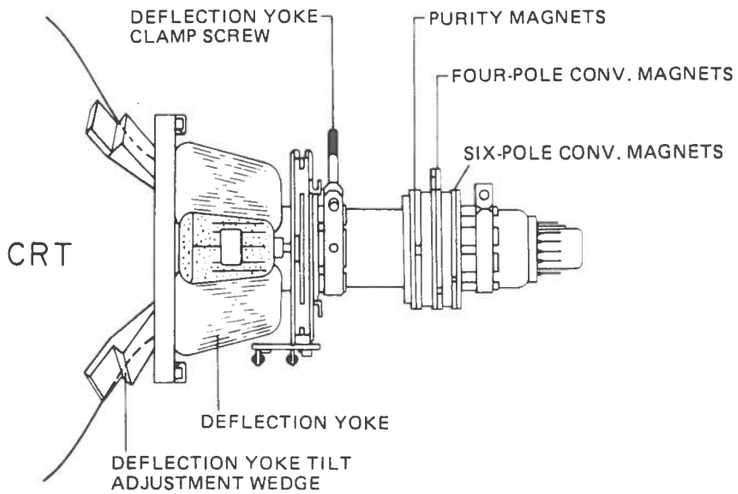
CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.
Front Mask, Model TCK-403P	4852013900
Front Mask, Model TCK-404P	4852013910
Cabinet, Rear Cover-Model TCK-403P	4852113400
Cabinet, Rear Cover-Model TCK-404P	4852113401
Knob-UHF Channel Selector-Models TCK-403P, TCK-404P	4854011701
Knob-VHF Channel Selector-Selector-Models TCK-403P TCK-404P	4854011700

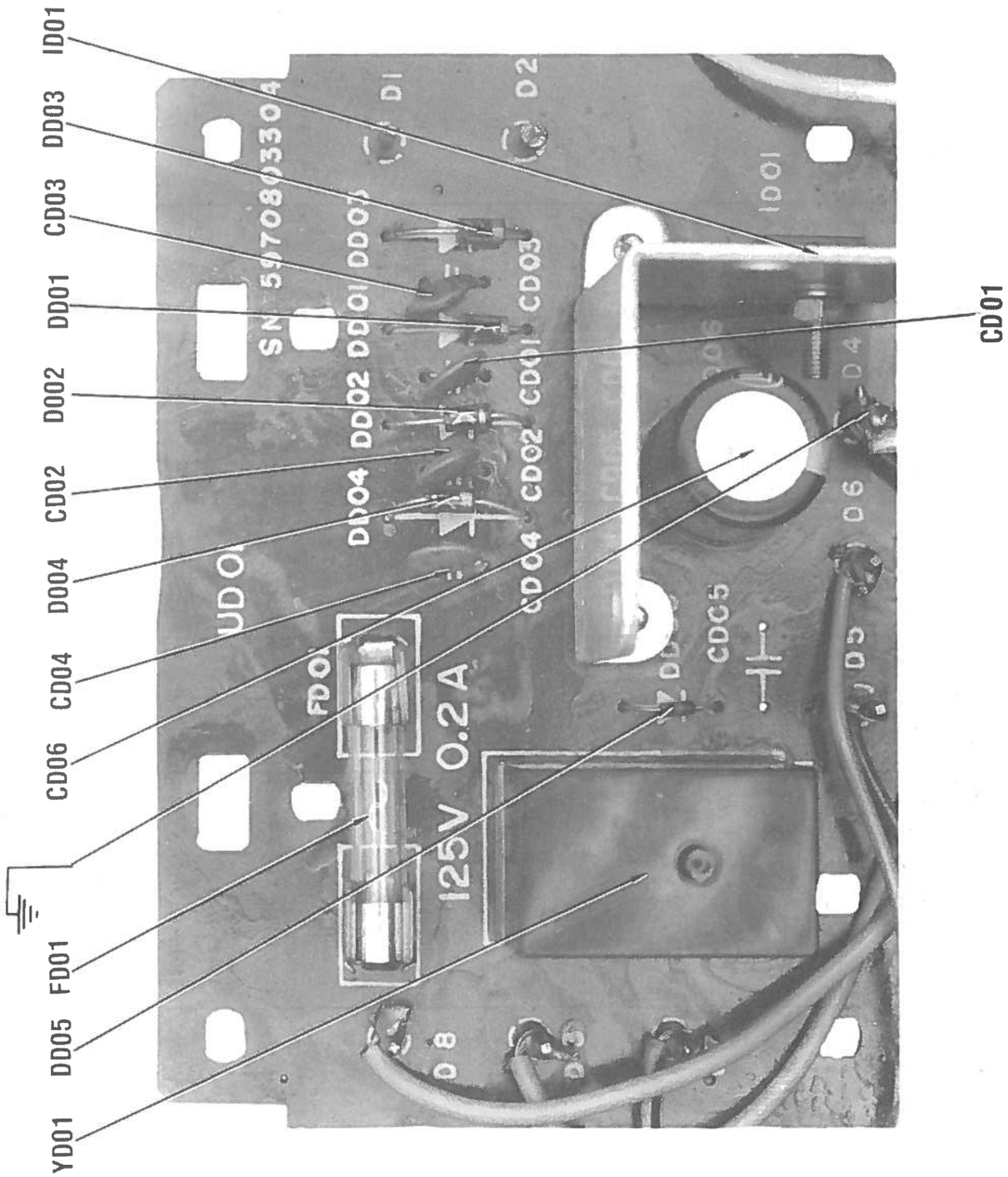
ITEM	PART No.
Knob-UHF/VHF Fine Tuning Models TCK-403P, TCK-404P	4854210900
Knob-On/Off/Volume-Models TCK-403P, TCK-404P	4854610700
Knob-Tint, Color, Contrast Brightness Vert Hold-Models TCK-403P, TCK-404P	4854610203

WIRING DATA

High Voltage Lead	Use BELDEN No.	9867 (30 KV)
Shielded Hook-up Wire	Use BELDEN No.	8401 or 8421 (Single-Conductor)
		8208 (Two-Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8529 (Solid) Available In 13 Colors
		8522 (Stranded) Available in 13 Colors
300-Ohm Tuner Input Lead	Use BELDEN No.	8225
75-Ohm Tuner Input Lead	Use BELDEN No.	8241
300-Ohm Antenna Lead-In	Use BELDEN No.	8275 (Foam Core) or 8285 (Foam Jacketed)
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) 4-Conductor
		8485 (Round) 5-Conductor
		8488 (Round) 8-Conductor



CRT NECK ASSEMBLY



POWER SUPPLY BOARD

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
W661	3 1/2" PM 8 OHM	5624080061	3A05Z8	

FUSE DEVICES

	ITEM NO.	DESCRIPTION	MFGR. PART NO.		NOTES
			DEVICE	HOLDER	
#	F801	3AMP @ 125V Fast Acting	5F1GC3021R	4857412600 (1)	
#	F802	400MA @ 250V Fast Acting	5F1GD4012R 5990640013 (2)	4857412600 (1)	
	FD01	200MA @ 125V Fast Acting			

\# For SAFETY use only equivalent replacement part.
(1) Two Used For Each Fuse.
(2) Models TCK-403P, TCK-404P.

MISCELLANEOUS

	ITEM No.	PART NAME	MFGR. PART No.	NOTES
#	CP01	Component Combination		VHF Antenna Isolation
#	CP02	Component Combination		VHF Antenna Isolation
#	CP03	Component Combination		VHF Antenna Isolation
#	CP04	Component Combination		VHF Antenna Isolation
#	CP701	Component Combination	5990200021	VHF Antenna Isolation used in Models TCK-403P, TCK-404P
#	CP702	Component Combination	5990200021	VHF Antenna Isolation used in Models TCK-403P, TCK-404P
#	CP703	Component Combination	5990200021	VHF Antenna Isolation used in Models TCK-403P, TCK-404P
#	CP704	Component Combination	5990200021	VHF Antenna Isolation used in Models TCK-403P, TCK-404P
#	CP705	Component Combination		UHF Antenna Isolation
#	CP706	Component Combination		UHF Antenna Isolation
	EP101	Jack	486SG80220	Earphone
#	H001	UHF Tuner	5720000082	Used In Models TCK-403P, TCK-404P
#	H002	VHF Tuner	5710000123	Used In Models TCK-403P, TCK-404P
#	L901	Degaussing Coil	5895250003	
	N101	Neon Bulb	486NE2Q200	VHF Indicator, used In Models TCK-403P, TCK-404P
	N102	Neon Bulb	486NE2Q200	UHF Indicator, used In Models TCK-403P, TCK-404P
	P801	Cord	5990700054	AC Power
	PW101	P.C. Board	5970803506	Main Board, Modesl TCK-403P, TCK-404P
#	PW401	P.C. Board	5970801800	Fail Safe, Models TCK-403P, TCK-404P
	S101	Switch	5430101001	AFT
#	S301	Switch	4854811300	Auto
#	SW501	Switch	5440501002	Auto/AFT/Power-On/Off, Used In Models TCK-403P, TCK-404P
#	SW701	Switch	5430101001	Normal/Cable, Used In Models TCK-403P, TCK-404P
	V901	CRT	370DJB22-TC09	
	V901A	Socket	5981010012	CRT
	X501	Crystal	5PHC6-UW	3.58MHz Oscillator
	YD01	Relay	54C0010010	Power On/Off
	Z101	Filter	5PF1030	Saw
	Z201	Filter	58T0000013	Video Trap
	Z202	Filter	58T0000014	3.58 MHz Trap
	Z601	Filter	5PSFE4.5MB	Ceramic, 4.5MHz
	Z602	Filter	5PSFE4.5MD	Ceramic, 4.5MHz

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA				NOTES
			NTE PART No.	ECG PART No.	RCA PART No.	ZENITH PART No.	
D201	1S34	5340200723	NTE109	ECG109	SK3090/109	103-Z9001	
D202	1S1553		NTE177	ECG177	SK9091/177	103-131	
	1S1553(TV)	5340200600	NTE177	ECG177	SK9091/177	103-131	
D203	SAME AS D201						
D204	1S1554		NTE177	ECG177	SK9091/177	103-131	
	1S1554(TV)	5340200601	NTE177	ECG177	SK9091/177	103-131	
D205 thru	1S1555		NTE177	ECG177	SK9091/177	103-131	
D304	1S1555(TV)	5340200040	NTE177	ECG177	SK9091/177	103-131	
D305,6	1S2775FA-1	5340200591	NTE552	ECG552	SK5002	103-287	
	1S2775(FA-1)		NTE552	ECG552	SK5002	103-287	
D307	SAME AS D205						
D308	S5295J	5340200901	NTE552	ECG552	SK9000/552	103-287	
D309	1S1887FA	5340200721	NTE116	ECG116	SK3312	212-76-02	
	1S1887(FA)		NTE116	ECG116	SK3312	212-76-02	
D310	SAME AS D202						
D401	SAME AS D205						
D402	SAME AS D202		NTE558	ECG558	SK3998/558	212-Z9010	
D403	1TH61	5340200724	NTE525	ECG525	SK3925/525	103-287	
	ERB26-20	5340200950	NTE552	ECG552	SK9000/552		
D441 thru	S5295G	5340200902					
D471							
D473 thru	SAME AS D205						
D502							
D601	SAME AS D202						
D801	1R5Z61	5340200722	NTE125	ECG125	SK3081/125	903-334	
D802	1S1555	5340200040	NTE177	ECG177	SK9091/177	103-131	
D803	02Z6.2W	5340300450	NTE5013A	ECG5013A	SK6A2/5013A	103-Z9008	
IC101	TA7607AP	5320200150	NTE1545	ECG1545	SK9379/1545		
IC301	TA7609P		NTE1496	ECG1496	SK9321/1496		
	TA7609PFA-2	5320200170	NTE1496	ECG1496	SK9321/1496		
	TA7609P(FA-2)				SK9321/1496		

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

RESISTORS (Power and Special)

	ITEM No.	RATING	REPLACEMENT DATA MFGR. PART No.	NTE PART No.	WORKMAN PART No.
#	R812	330 5% 1/8W Carbon Film 200 2% 1/8W Carbon Film	RD-8M201G		
#	R813	33K 5% 2W Metal Oxide	RS02K333JF RS02L333JF	2W333 2W333	22-4132 22-4132
#	R910	7 Cold PTC 15 Cold PTC	DPTH624-10 5180300202		FR605 FR605 FR605
#	R920	3.0 2% 2W Fusible 3.0 5% 2W Fusible	RF02K309J RF929309J	F2W3D0 F2W3D0	

For SAFETY use only equivalent replacement part.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
DL201	Delay Line	5800000003
L101	Peaking (.55UH)	58C5580019 9TRF9225 (1)
L102	Video IF	58B0000025 9TRF1221 (1)
L103	Video IF	58B0000026 9TRF1222 (1)
L104	RF Choke (24UH)	58P240J025 9PL24A (1)
L105	Peaking (2.3UH)	58C2490020 9AZ9246F (1)
L161	RF Choke (.55UH)	58C5580019 9TRF9225 (1)
L171	AFT	58E0000001 9TRF1223 (1)
L202	Peaking (39UH)	58P390J029 9PL39A (1)
L301	RF Choke (300UH)	58C3010021 9TRF9209 (1)
L401	Peaking (1.0UH)	58P109K018 9PL1R0B (1)
# L403	RF Choke	58C0000022 9HC5035 (1)
L409	RF Choke (94UH)	58C940K023 9AZ9004Y (1)

ITEM No.	FUNCTION	MFGR. PART No.
# L425	RF Choke	58C0000026 9HC4035 (1)
# L441	RF Choke	58C0000022 9HC5035 (1)
L443	RF Choke (94UH)	58C940K023 9AZ9004Y (1)
L501	RF Choke (30UH)	58P300J022 9PL30A (1)
L502	Peaking	58P682J023 9TRF5012 (1)
L505	Chroma Sync	58P0000024
L510	Peaking (10.2UH)	58C1000024 9AZ9246G (1)
L511	Peaking (10.2UH)	58C1000024 9AZ9246G (1)
L512	Peaking (10.2UH)	58C1000024 9AZ9246G (1)
L601	Peaking (13UH)	58P130J028 9PL13A (1)
# L701	Balun	9TB3007605
# T801	Line Filter	5PPN000112 591040001 (1)

For SAFETY use only equivalent replacement part.
(1) Models TCK-403P, TCK-404P.

COILS & TRANSFORMERS

	ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
#	L499	Yoke Horiz 1.76MH 90° Vert 92MH	Part of 370DJB22-TC09(Y)	YS-51426 (1)	
#	T01	Power Transformer		TPW-21224KU (1)	
	T304	Pincushion	5TCU000004 9TPG2009A (3)	SPC2009 (1)	
	T401	Horiz Driver	5TDK000004 9TLN1027 (3)	TLN1027 (1)	
#	T461	Horiz Output	5THU000020 (2)	MSHS351 (1)	
#	T461	Horiz Output	5THU000022 (2) 9FS51708 (3)	FS-51708 (1)	
	T661	Audio Output	5T00000003 9TPS1035 (3)	TSP1035 (1)	

For SAFETY use only equivalent replacement part.
(1) Number On Unit.
(2) Used In Some Versions.
(3) Models TCK-403P, TCK-404P.

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA NTE PART No.	ECG PART No.	RCA PART No.	ZENITH PART No.	NOTES
IC501	TA7608CP	5320200160	NTE1532	ECG1532	SK9320/1532		
	TA7608CPFA-5		NTE1532	ECG1532	SK9320/1532		
	TA7608CPFA-6		NTE1532	ECG1532	SK9320/1532		
IC601	TA7176AP	5320200050	NTE1236	ECG1236	SK7784/1236	221-48	
	MC1358P		NTE712	ECG712	SK3072/712	221-48	
	TA7176AP(FA-1)		NTE1236	ECG1236	SK7784/1236	221-48	
Q161	2SC1188-O	5310200210	NTE229	ECG229	SK3246A/229	121-Z9021	
	2SC388A		NTE85	ECG85	SK3132	121-722*	
Q202	(KT)A562-O	5310200102	NTE290A	ECG290A	SK3114A/290A	121-Z9003*	
	KTA562TM-O		NTE290A	ECG290A	SK3114A/290A	121-Z9003*	
	2SA562-O		NTE290A	ECG290A	SK3114A/290A	121-Z9003*	
Q303	2SC2229-O	5310200910	NTE399	ECG399	SK3244	121-Z9045*	
Q306	2SC2073	5310200930	NTE375	ECG375	SK3929	121-Z9106	
Q307	2SA940	5310400011	NTE398	ECG398	SK3930	121-Z9115	
Q402	2SC2068	5310200901	NTE376	ECG376	SK3219	121-Z9028	
	2SC2068FA-1		NTE376	ECG376	SK3219	121-Z9028	
	2SC2068(FA-1)		NTE376	ECG376	SK3219	121-Z9028	
Q404	2SC1893	5310200950	NTE389	ECG389	SK3710/238	121-1029	
Q505 thru Q509	2SC2068	5310200902	NTE376	ECG376	SK3219	121-Z9028	
Q603,4	2SC2230AY	5310200920	NTE399	ECG399	SK9352/399	121-Z9045*	
	2SC2230A-Y		NTE399	ECG399	SK9352/399	121-Z9045*	
	2SC2230A-GR		NTE399	ECG399	SK9352/399	121-Z9045*	
Q801	2SD657	5310200875	NTE162	ECG162	SK3559/162	121-Z9018	
	2SC1195		NTE94	ECG694	SK3836/284	121-Z9018	Used In some versions
	2SC1829FA-1		NTE94	ECG686	SK9297/86	121-Z9018	Used In some versions
Q802	2SC2229-O	5310200910	NTE399	ECG399	SK3244	121-Z9045*	
Q803	2SC2120Y		NTE289A	ECG289A	SK3849/293	921-1114*	
	2SC2120-Y	5310200940	NTE289A	ECG289A	SK3849/293	921-1114*	
Q804	2SC2229Y		NTE399	ECG399	SK3244	121-Z9045*	
	2SC2229-Y	5310200911	NTE399	ECG399	SK3244	121-Z9045	

* Lead configuration may vary from original.

When ordering parts, state Model, Part Number, and Description

ELECTROLYTIC CAPACITORS

	ITEM No.	RATING	MFGR. PART No.
#	C207	3.3 50V	CE2W1H339
	C308	2.2 50V 10%	5240222906
	C317	2.2 50V 10%	5240222906
#	C445	33 160V	CECD2C330A
			CE2W2C330
#	C449	10 250V	CEBD2E100A
			CE2W2E100
#	C471	2.2 450V	
		2.2 315V	CEBD2F229A
			CE2W2F229
#	C473	47 10V	CE2W1A470
#	C802	680 200V	CEY2D681D
			CE3W2D681

For SAFETY use only equivalent replacement part.
Items Not Listed Are Normally Available At Local Distributors.

CAPACITORS

	ITEM No.	RATING	MFGR. PART No.
	C171	2pF 50V ± .25	CISL1H209C
	C172	2pF 50V ± .25	CISL1H209C
	C173	8pF 50V ± .25	CISL1H809C
#	C421	390 500V 10%	CCBB2H391K
			CK1B2H391K
#	C426	180 2KV 10%	CYYN3D181K
			C1YN3D181K
#	C427	.001 1.25K 10%	CMKM3B102K
			CQ2M3B102K
#	C443	.22 200V 5%	CMHM2D224J
			CQ2M2D224J
#	C444	.3 200V 5%	CMHM2D304J
			CQ2M2D304J
#	C446	.0039 1.6KV 5%	CMKM3C392J
			CQ2M3C392J
#	C447	.0036 1.6KV 5%	CMHM3C362J
			CQ2M3C362J
#	C448	.056 200V 5%	CMFM2D563J
		.056 200V 10%	CQ2M2D563K
#	C705	3.3 NPO 500V ±.25	CICH2H339C
#	C801	.1 125VAC 20%	CL2B103MUC
#	C803	.0022 500V 10%	CK1B2H222K

For SAFETY use only equivalent replacement part.
Items Not Listed Are Normally Available At Local Distributors.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

	ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
	R152	AGC Delay	5000	RVAL17502B	
				553472009B	
	R158	AFT Balance	1M	RVAL17105B	
				553105009B	
	R252	Green Drive	220	RVAL17221B	
				553221009B	
	R253	Blue Drive	220	RVAL17221B	
				553221009B	
#	R254	Contrast	10K	551103017B	
#	R255	Brightness	10K	551103017B	
#	R257	Sub Brightness	2000	RVAS12202B	
				553202104B	
#	R351	Vert Hold	200K	551204001B	
				551204017B	
				4857410501	
#	R352	Height	100K	RVAS12104B	
				553104104B	
#	R451	Horiz Hold	10K	RVAS12103B	
				553103104B	
#	R551	Tint Preset	10K	553103N20B	
#	R552	Color Preset	10K	553103N20B	
#	R554	Tint	10K	551103018B	
#	R555	Color	10K	551103018B	
#	R557	Red Bias	10K	RVAS12103B	
				553103104B	
#	R558	Green Bias	10K	RVAS12103B	
				553103104B	
#	R559	Blue Bias	10K	RVAS12103B	
				553103104B	

When ordering parts, state Model, Part Number, and Description

CONTROLS (All wattages 1/2 watt, or less, unless listed)

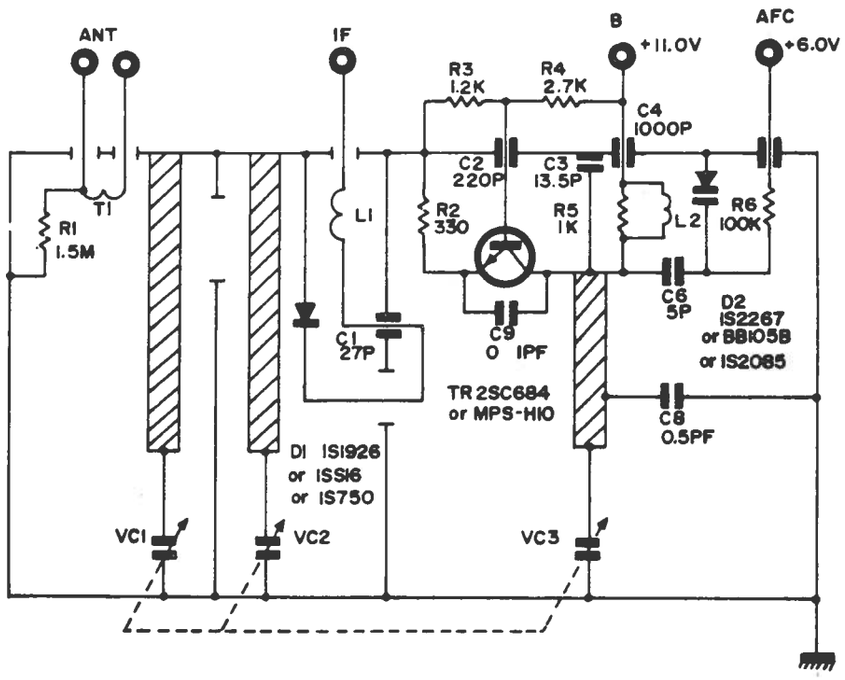
	ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
	R651	Volume	100K	(1)	
#	R851	112 Volt Adjust	470	553471009B	
	R951	Screen	1M	RVAQ10105B	
				553105010B	
#	Z401	Focus Pack		4850B00210	
				5540000020	

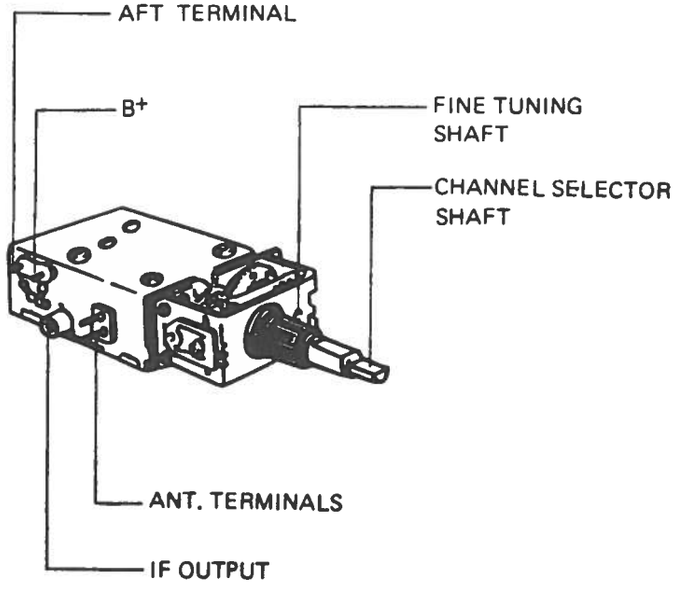
For SAFETY use only equivalent replacement part.
(1) Used in Models TCK-403P, TCK-404P.

RESISTORS (Power and Special)

	ITEM No.	RATING	REPLACEMENT DATA		
			MFGR. PART No.	NTE PART No.	WORKMAN PART No.
#	R216	47K 2% 1/8W Carbon Film	RD-4L473G		
#	R217	75K 2% 1/8W Carbon Film	RD-8M753G		
#	R318	10 5% 1/2W Fusible	RF-2P100J		
	R406	15K 2% 1/2W Metal Oxide Film	RS-2L153G	HW315	
	R407	105K 2% 1/8W Carbon Film	RD-8M154G	QW415	
#	R409	10K 5% 3W Metal Oxide Film	RS03P103J		
#	R410	22K 5% 1W Metal Oxide Film	RS01H223J	1W322	22-3128
#	R414	390K 10% 1/2W Carbon Comp	RC-2P394K	HW439	
#	R422	5600 5% 3W Metal Oxide Film	RS03P562JF		
		2400 5% 3W Metal Oxide Film	RS03L242JF		
#	R442	3.9 5% 1W Fusible	RF01H399J	F1W3D9	
			RF01P399J	F1W3D9	
#	R443	1 10% 1/2W Fusible	RF-2H109K		
			RF-2P109K		
#	R445	2000 5% 1/8W Carbon Film	RD-8M202J		
#	R446	2000 5% 1/8W Carbon Film	RD-8M202J		
#	R460	560K 5% .1W Varistor	DTNR560K		
			5180100300		
#	R471	10K 2% 1/8W Carbon Film	RD-4L103G		
#	R472	75K 2% 1/8W Carbon Film	RD-4L753G		
#	R473	4700 5% 1/8W Carbon Film	RD-8M472J		
#	R474	18K 2% 1/8W Carbon Film	RD-4L183G		
	R484	180K 2% 1/2W Carbon Film	RC-2P184J	HW418	
#	R540	15K 5% 2W Metal Oxide Film	RS02K153J	2W315	22-4124
			RS02L153J	2W315	22-4124
#	R541	15K 5% 2W Metal Oxide Film	RS02K153J	2W315	22-4124
			RS02L153J	2W315	22-4124
#	R542	15K 5% 2W Metal Oxide Film	RS02K153J	2W315	22-4124
			RS02L153J	2W315	22-4124
#	R613	560 10% 1W Fusible	RF-2F561J		
		560 10% 1/2W Fusible	RF01P561J		
#	R801	3.3 5% 15W W W	RX15Y339J		
			RX15H339J		
#	R802	200 5% 25W W W	RX25Y201J		
			RX25H171J		
#	R803	12K 5% 2W Metal Oxide Film	RS02K123JF	2W312	22-4122
			RS02L123JF	2W312	22-4122
#	R806	13K 5% 2W Metal Oxide Film	RS02K133JF	2W313	
			RS02L133JF	2W313	
#	R807	.68 10% 2W Metal Film	RN02K688K	2WD68	
		.68 5% 2W Metal Film	RN02L688J	2WD68	
#	R810	36K 2% 1W Metal Oxide Film	RS01H363G	1W336	
			RS01L363G		
#	R811	1800 2% 1/8W Carbon Film	RD-8M182G		

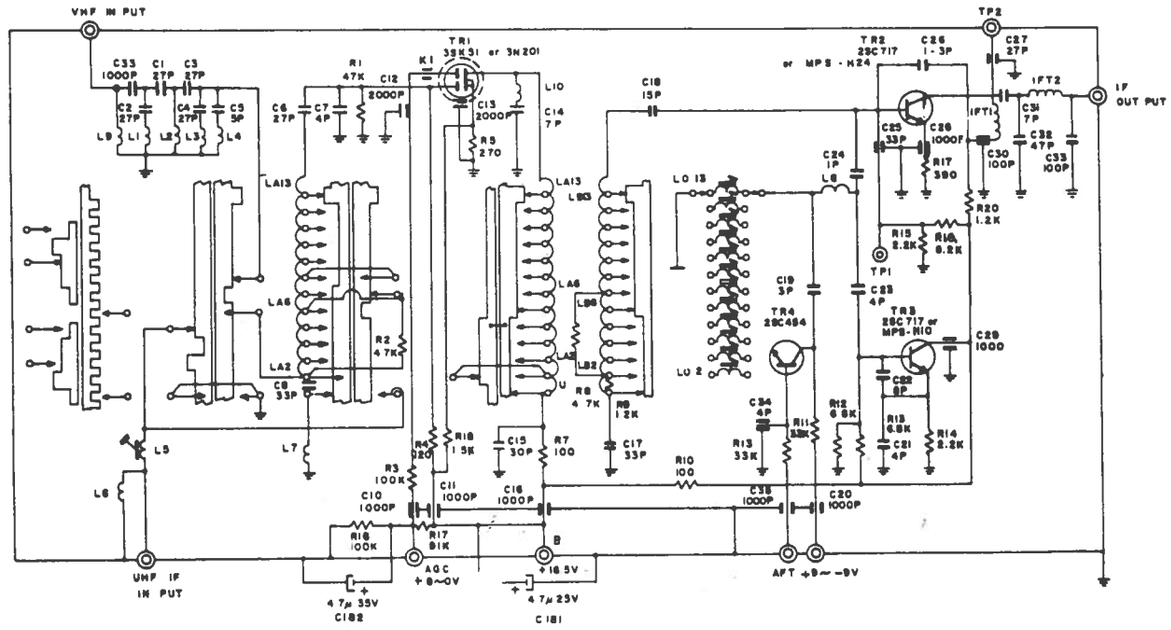
UHF TUNER INFORMATION
(UAMI-735A)





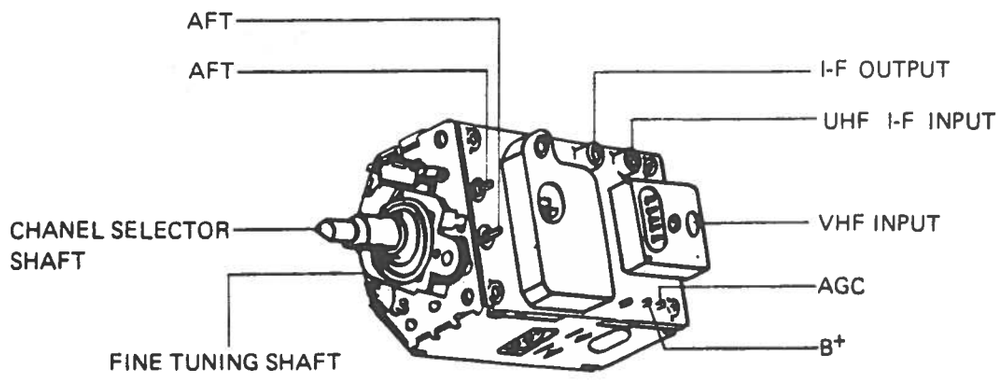
UHF TUNER SCHEMATIC

VHF TUNER INFORMATION
(VAT3-708)



NOTES: All switches are in channel 13 position voltage readings shown above are nominal value with no input signal.

WARNING: BEFORE SERVING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE"



Courtesy of Manufacturer

VHF TUNER SCHEMATIC